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ALAMEDA POINT
ALAMEDA, CALIFORNIA

QUALITY CONTROL SUMMARY REPORT
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LIST OF ACRONYMS

µg/L	microgram per liter
CLP	Contract Laboratory Program
CRDL	Contract-required detection limit
DQO	Data quality objective
EPA	U.S. Environmental Protection Agency
GC	Gas chromatography
LCS	Laboratory control sample
LDC	Laboratory Data Consultants, Inc.
MS	Matrix spike
MSD	Matrix spike duplicate
OC	Organochloride
PARCC	Precision, accuracy, representativeness, completeness, and comparability
PCB	Polychlorinated biphenyl
PRC	PRC Environmental Management, Inc.
QAPP	Quality assurance project plan
QC	Quality control
QCSR	Quality control summary report
RI/FS	Remedial investigation/feasibility study
RPD	Relative percent difference
SDG	Sample delivery group
SOW	Statement of work
SVOC	Semivolatile organic compound
TDS	Total dissolved solids
TEPH	Total extractable petroleum hydrocarbons
TOC	Total organic carbon
TPPH	Total purgeable petroleum hydrocarbons
VOC	Volatile organic compound

1.0 INTRODUCTION

This quality control summary report (QCSR) documents and summarizes the compliance of the analytical data in supporting the data quality objectives (DQO) for quarterly groundwater monitoring activities at Alameda Point, formerly Naval Air Station Alameda, California. The DQOs for the quarterly groundwater monitoring activities are presented in Section 2.0 of this QCSR. The methods and techniques that will yield analytical data of acceptable quality and quantity to support the DQOs are documented in the "NAS Alameda Groundwater Monitoring Plan, Volume IIb, Quality Assurance Project Plan (QAPP) Addendum" (PRC Environmental Management, Inc. [PRC] 1997a). Acceptability of data, evaluated by the critical indicator parameters of precision, accuracy, representativeness, completeness, and comparability (PARCC), was determined through the process of data validation. The PARCC parameters are discussed in Section 3.0 of this QCSR; the results of the data validation process for the quarterly groundwater monitoring activities are summarized in Section 4.0, and include a discussion of general quality control issues. Specific quality control (QC) issues are discussed in the individual data validation narratives presented in Appendix A. Appendix B contains the tabulated validated analytical data with appropriate validation qualifiers and comment codes to explain the qualifications. All original analytical data packages from the laboratory were bound and archived at the Tetra Tech EM Inc.'s (TtEMI) Sacramento office.

2.0 DATA QUALITY OBJECTIVES

The history of Alameda Point, a description of the sites, and previous investigations conducted at the sites, are discussed in the "Remedial Investigation/Feasibility Study Work Plan Addendum" (PRC 1993) and in the Field Sampling Plan (PRC 1997b). The overall objective of the sampling activities was to collect the chemical and physical data necessary to further characterize groundwater at Alameda Point. The specific objectives of this groundwater monitoring program were to: (1) collect investigative samples to assess potential migration of groundwater contaminants, and (2) conduct sampling on a quarterly basis for 1 year to monitor potential groundwater contaminant levels through time. To satisfy these objectives, 98 wells were sampled during each of the quarterly rounds of groundwater sampling. Monitoring wells at Site 2 were not sampled during the third quarter due to nesting Least Terns.

The DQOs for the site characterization of Alameda Point were developed following the U.S. Environmental Protection Agency (EPA) document "Guidance for the Data Quality Objectives Process"

(EPA 1994a). Primary DQOs for the characterization of Alameda Point have been identified as the following: (1) aid in establishing the nature and extent of potential contamination, and (2) provide information for a qualitative risk assessment as part of the RI.

The DQO process is a series of planning steps based on the scientific method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application. The EPA DQO process was used to develop the sampling process design presented in Section 5.1 of the project QAPP.

Laboratory Data Consultants, Inc. (LDC), TtEMI's data validation subcontractor, validated the analytical data according to the "Navy CLEAN II Laboratory Services Statement of Work" (PRC 1995) and the following EPA documents: "U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (1994b) and "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (1994c). The laboratory provided the following information required to validate the data: all raw data, calibration information, instrument printouts for samples and standards, instrument run logs, bench sheets, standards information, and QC sample results. EPA Contract Laboratory Program (CLP) deliverables packages were provided for analyses performed according to methods in the CLP statement of work (SOW).

A cursory validation was performed on the data for all samples. As specified in the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a), 10 percent of the samples were randomly selected for full validation review. During the reviews, if the data indicated systematic errors affecting positive results for samples not originally selected for full validation, then those samples were additionally reviewed for full validation requirements. This effort resulted in greater than 10 percent of the samples undergoing full validation review. A description of criteria reviewed during cursory and full validation is presented in Table 1. LDC generated validation reports for each sample delivery group (SDG) received from the laboratory; these reports are included in Appendix A.

The validated analytical results provided data rated as definitive quality as defined by EPA (1994a). Definitive data deliverables are suitable for the DQOs of this project.

3.0 CRITICAL PARAMETERS

Through the data validation process, the data were evaluated for acceptable quality and appropriate frequency, based on the critical indicator PARCC parameters. The assessment of these indicator parameters is discussed in the following sections.

3.1 PRECISION

Precision was measured by evaluating field duplicate samples, matrix spike duplicate (MSD) samples, and matrix duplicate samples. Precision is expressed as the relative percent difference (RPD) of a pair. Precision acceptance criteria for each analytical methodology are stated in Tables 3-1 through 3-4 of the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) and are included as an attachment to this QCSR. During the process of data validation, all field duplicate samples, matrix spike/matrix spike duplicate (MS/MSD) pairs, and matrix duplicate pairs were evaluated for compliance with the acceptance criteria for precision for each analytical methodology. The RPD evaluations are documented in the individual data validation reports for each SDG (see Appendix A of this QCSR).

Forty groundwater field duplicate pairs (10 percent of the groundwater samples) were collected and submitted to the laboratory as blind duplicate samples. The collection frequency criteria specified in the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997A) were met. Table 2 identifies all field duplicate pairs.

MS/MSD pairs and matrix duplicate pairs were analyzed in every laboratory SDG except those discussed in the data validation case narratives for SDGs AAW01 through AAW07. The MSD pairs are listed in Table 2. The criterion for the frequency of analysis of MSD pairs or matrix duplicate pairs specified in the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) is 5 percent, or one pair per analytical batch. Although not all SDGs had MS/MSDs were analyzed for all analyses due to miscommunication problems with the laboratory, the frequency of MS/MSD collection criterion was met for all analyses. When judged appropriate during data validation, detected and nondetected results were qualified as detected estimated (Jc/UJc) based on matrix duplicate precision criteria. In general, precision problems were experienced only with metals.

3.2 ACCURACY

Accuracy was measured by evaluating MS samples, laboratory control samples (LCS), surrogate recoveries, and method blanks. Accuracy is expressed as percent recovery. The percent recovery acceptance criteria for each analytical methodology are stated in Tables 3-1 through 3-4 of the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) and are included as an attachment to this QCSR. Through the process of data validation, all MS, LCS, and surrogate recoveries were evaluated for compliance with the acceptance criteria for accuracy for each applicable analytical methodology. The evaluations of percent recovery are documented in the individual data validation reports for each SDG (Appendix A).

As discussed in Section 3.1, the frequency of collection of MS samples met the criteria specified in the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) of 5 percent of the samples; however, SDGs AAW01 through AAW07 did not always have the designated MS/MSD analyzed for organic parameters. The samples used for MS/MSDs are listed in Table 2. When judged appropriate during data validation, sample results were qualified as detected estimated (Jc) and nondetected estimated (UJc) based on MS/MSD recovery criteria. In 83 severe cases for metals analyses where recoveries were less than 30 percent, nondetected results for silver and selenium were rejected (Rc). These qualified samples are presented in Table 3.

LCSs were analyzed for all parameters in each SDG. LCS results were used to qualify 48 sample results for silver as detected estimated (Jh) and nondetected estimated (UJh).

Surrogate spikes were evaluated for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), organochlorine (OC) pesticides and polychlorinated biphenyls (PCB), total purgeable petroleum hydrocarbon (TPPH), and total extractable petroleum hydrocarbon (TEPH). Twenty-six samples for VOCs, three samples for SVOCs, eight samples for OC pesticides and PCB analyses, six samples for TPPH, and nine samples for TEPH were qualified as detected estimated (Ja) and/or nondetected estimated (UJa) based on surrogate nonconformances. No sample results were rejected (R) based on surrogate results.

3.3 REPRESENTATIVENESS

Sample results were evaluated for representativeness by examining information related to collection of samples, such as chain-of-custody documentation, which included labeling of samples, collection dates, and the condition of the samples upon receipt at the laboratory. Laboratory procedures were also examined, including: (1) anomalies reported by the laboratory either upon receipt of the samples at the laboratory or during the analytical process, (2) holding time of samples prior to analysis, (3) calibration of laboratory instruments, (4) adherence to the analytical methods, (5) quantitation limits used for the samples, and (6) completeness of data package documentation. Any item that adversely affected the representativeness of the sample result is documented in the data validation narrative.

Holding times were met for all samples with the specific exceptions noted in Section 4.0. One sample for VOCs, two samples for SVOCs, one sample for OC pesticides and PCBs, 15 re-extracted samples for TEPH, 20 samples for total dissolved solids (TDS), 69 samples for nitrate/nitrite, 50 samples for phosphate, and two samples for sulfide were qualified as detected estimated (Jh) and nondetected estimated (UJh) based on missed holding times. The missed holding times included re-extraction or re-analysis of samples to confirm QC nonconformances or analytical results.

Calibration problems were a frequent cause for qualification of VOCs, SVOCs, and selected metals. The organic compounds were qualified based on the calibration criteria identified by the functional guidelines. The metals results qualified based on calibration problems included aluminum, cadmium, copper, and iron. The details regarding these nonconformances are presented in the data validation case narratives in Appendix A.

Laboratory method blank, field blank, equipment rinsate blank, and trip blank results were evaluated during data validation to determine whether field conditions, decontamination procedures, travel conditions, or laboratory conditions may have affected the sample results. For VOCs, SVOCs, and metals, the method blank contamination detected was considered common laboratory contamination. No samples were rejected on the basis of blank contamination. A discussion of the analytical results for the laboratory method blanks, field blanks, equipment rinsate blanks, and trip blanks is included in Section 4.0. Table 2 lists all field blanks, equipment rinsate blanks, and trip blanks collected.

3.4 COMPLETENESS

Completeness is defined as the percentage of measurements judged valid. The validity of sample results is determined through the data validation process. All sample results that were rejected (R) and any missing analyses were considered incomplete. Data that were qualified as detected estimated (J) or nondetected estimated (UJ) were considered valid and usable. Table 3 lists all incomplete sample numbers and provides the reason for incompleteness.

The completeness goal stated in the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) is 90 percent and is measured by the number of complete valid sample results divided by the total number of sample results. To calculate the total number of sample analyses, each compound or analyte for each methodology is multiplied by the total number of samples analyzed. The completeness goal was met with 96.9 percent completeness for this project.

3.5 COMPARABILITY

Comparability of the data is a qualitative parameter that expresses the confidence with which one data set may be compared to another. Comparability of the data was achieved by the use of standard methods of analysis, standard quantitation limits, and the standardized data validation procedures.

All elevated reporting limits were assessed during the data validation process to determine if there was a justifiable reason for raised reporting limits. Reporting limits were usually raised due to dilutions for quantitation. However, the laboratory used reporting limits for TEPH and sulfide and phosphate analyses that did not meet the Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) required reporting limits. This problem was judged to have no detrimental impact on the quality of the results for this project.

The results of these four quarters of groundwater monitoring samples were compared with the previous year's results to assess comparability of overall results. With the exception of metals (potassium, sodium, and magnesium) and general chemistry parameters (alkalinity and total dissolved solids), the results were comparable to the previous year's data results. These analytes were considered to be highly variable based on the remediation system influences, season, and tide influence of the groundwater for

these wells. This problem was judged to have no detrimental impact on the quality of the results for this project.

4.0 DATA VALIDATION SUMMARY

This section describes the process of data validation and summarizes the results by methodology. Specific details in this summary concerning any of the comments for a particular sample or batch of samples are available in the data validation narrative for the associated SDG (Appendix A).

4.1 DATA VALIDATION PROCESS

Samples were analyzed by the laboratories in SDGs that consisted of approximately 20 samples each. All analytical methods for each SDG were validated based on the criteria in the functional guidelines and a validation narrative was prepared for each SDG (Appendix A). Each validation narrative contains a list of the samples in that SDG, the analyses performed, the identity of the samples receiving full validation, and the results of the validation for each methodology. All samples in each SDG received a cursory validation review, and initially 10 percent of the samples for each of the analyses performed received a full validation review. Table 2 identifies the samples in each SDG that received full validation.

During data validation, validators completed worksheets that documented the criteria reviewed. These worksheets were used to generate the validation narrative. The worksheets are part of the complete data validation report, which is archived in TtEMI's Sacramento office.

Once the data were reviewed, data validation qualifiers were applied to the analytical results. Data validation qualifiers are alphabetic characters placed adjacent to each report value that correspond to definitions specified by functional guidelines. The functional guidelines for data validation qualifiers and their definitions are listed in Table 4. The laboratory submits analytical reports with laboratory qualifiers, which are defined by either the EPA CLP SOW or the laboratory SOW (PRC 1995). Data submitted with CLP- or laboratory-defined qualifiers identify such items as nondetected values, values below the contract-required quantitation limit (CRDL) (considered estimated values), and values with problems during the analysis. These CLP- or laboratory-defined data qualifiers were evaluated for appropriateness and replaced as deemed necessary with the functional guidelines for the data validation qualifiers after data validation in order to inform the data user of the validity of the data. Appendix B

contains the laboratory data with the appropriate data validation qualifiers. A database program created at TtEMI was used to transfer data from the laboratory on an ASCII-formatted diskette. This database allowed (1) data validation qualifiers to be substituted as necessary for the original laboratory qualifiers, (2) correction of detected data errors, (3) other software to be interfaced, and (4) tables to be printed with the validated results in various formats. The analytical results included in Appendix B have been produced from this TtEMI database.

In addition to the analytical results with the associated qualifiers, the printed tables also include a comment column. The comment column is used to provide an explanation for the assigned qualifier. The letters "a" through "h" are used to cite different QC issues that may have impacted the analytical results. The associated definitions for these comment codes are provided in Table 4.

4.2 SAMPLE DATA ASSESSMENT

Sample data were reported by the laboratories in 23 SDGs. SDGs received from RECRA LabNet were labeled as AAW01 through AAW23. The samples consisted of groundwater samples, as well as associated QC samples such as trip blanks, equipment rinsate blanks, and field blanks.

The validity of the data is discussed below by analytical methodology. The discussion is intended to provide a general summary; specific details may be found in the data validation narratives (Appendix A).

4.2.1 Volatile Organic Compounds

All VOC data were assessed to be valid except for acetone, bromomethane, 2-butanone, and/or 2-hexanone, which were qualified as rejected (R) in 455 primary samples. The relative response factors for these compounds were below the criteria for acceptance for the initial calibration, and/or the continuing calibration relative response factors were lower than the criteria associated with the affected samples. In addition, one sample was qualified as rejected (Rh) for nondetected VOCs because the analysis was performed 24 days past the 14-day holding time for this analysis. The affected samples are identified in Table 3. Comparing the results for these 4 quarters to the results for the previous four quarters indicated that the values and analytes detected are consistent with previous results. A total of 957 VOC results were qualified as rejected (R) out of 17,425 total results (94 percent complete); therefore, the completeness goal for this parameter was met.

VOCs were qualified detected estimated (Jf) and nondetected estimated (UJf) in over 230 primary samples due to calibration problems. The percent difference between the initial calibration mean relative response factors and the continuing calibration relative response factor for several compounds were outside the acceptance criteria of 25 percent. For low concentration water analyses, the acceptance criterion is 30 percent. The compounds included acetone, vinyl chloride, chloromethane, 2-hexanone, and bromomethane. These compounds were qualified based on the criteria identified by the functional guidelines. In addition, some of these compounds were identified as historically exhibiting poor response or erratic behavior in the functional guidelines.

The VOCs that represent common laboratory contamination such as acetone, 2-butanone, and/or methylene chloride were reported in the 21 samples and the results were qualified as nondetected estimated (UJb). Due to trip blank contamination of cis-1, 2-dichloroethene, the results of the eight associated samples were qualified as nondetected estimated (UJb). Due to field blank contamination of chloroform, the results of the two associated samples were qualified as nondetected estimated (UJb).

Due to technical holding time problems, VOCs in 27 samples were qualified as detected estimated (Jh) and nondetected estimated (UJh). The holding time for aromatic VOCs in unpreserved samples is 7 days for water samples. For preserved water samples, the holding time for all VOCs is 14 days. The analysis holding time was exceeded in several SDGs and ranged from one to 23 days for these samples. However, these qualified sample results included dilutions, re-extractions, or re-analysis to confirm original results. Both sets of data were provided in the analytical reports. The original analyses were retained in the data tables. These data were compared to analytical results from previous quarters and the results were consistent with previously detected results.

Due to cooler temperatures that were reported between 4.7 to 15.8°C at the time of sample log-in by the laboratory, sample results for 42 samples were qualified as detected estimated (Jh) and nondetected estimated (UJh). The details regarding the data validation process are provided in the narratives presented in Appendix A. The analytical results for these samples were compared to analytical results from previous quarters and the results were consistent with previously detected results.

Due to the internal standard area counts, nine sample results were qualified as detected estimated (Je) or nondetected estimated (UJe). The details regarding the data validation process are provided in

Appendix A.

Minor surrogate recovery problems occurred in a few samples, as a result of low surrogate recoveries all VOCs for 21 samples were qualified as detected estimated (Ja) and nondetected estimated (UJa). These sample results included reanalysis of samples to confirm results or dilutions for quantitation of results in the appropriate range. Due to high surrogate recoveries, the results in five samples were qualified as detected estimated (Ja) only. When the percent recoveries demonstrated a high bias and the samples were nondetected, the sample results were not qualified. In these cases, the problem was judged to have no detrimental impact on the quality of these samples for this project. The details regarding the data validation process are provided in Appendix A.

Five samples were qualified as detected estimated (Jc) and nondetected estimated (UJc) based on MS/MSD problems. As discussed in Section 3.1, MS/MSDs were not analyzed with every SDG of project samples analyzed for VOCs. Although this is a Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) protocol violation, the associated surrogates and LCS recoveries (except in four samples) were acceptable and therefore no data required qualification. These sample results were qualified based on the combined LCS and surrogate results. Details regarding the data validation process are provided in the narratives in Appendix A. For those SDGs with associated MS/MSD results, all but five recoveries and RPDs were within acceptance criteria. In cases where recoveries or RPD exceeded criteria, the five samples were qualified as detected estimated (Jc) and nondetected estimated (UJc).

Due to LCS problems, 20 samples were qualified as detected estimated (Jc) and nondetected estimated (UJc). Although LCSs are not required under the CLP SOW, the TtEMI Laboratory Statement of Work (PRC 1995) does require the analysis of LCSs for each SDG and the laboratory performed the analysis of these samples. The percent recoveries and RPDs were evaluated against CLP MS/MSD criteria and were within the criteria with QC limits. In cases where recoveries or RPD exceed criteria, the sample results were evaluated and 20 of the associated sample results were qualified as detected estimated (Jc) and nondetected estimated (UJc).

The water field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

For 96 samples, target analytes were present in concentrations which exceeded the calibration range for the quantitation, but these samples were not diluted for accurate quantitation. In these cases, the sample results were qualified as detected estimated (Jf). These were discussed in more detail where applicable in the data validation narratives (Appendix A).

4.2.2 Semivolatile Organic Compounds

All SVOCs were assessed to be valid with the exception of 103 compound results. Due to nonconformances with initial and continuing calibration relative response factors, these SVOC results were qualified as rejected (Rf). The data validation narratives provide more detail for review of the data. Comparing the results for the previous four quarters to the results for these four quarters indicated that the values and analytes detected are consistent with previous results. Table 3 presents the samples and compounds affected by these nonconformances. A total of 103 SVOC results were qualified as rejected (Rf) out of 4,992 total results (98 percent complete); therefore, the completeness goal for this parameter was met.

SVOCs were qualified as estimated (Jf) or nondetected estimated (UJf) due to calibration problems for 71 primary samples. The percent difference between the initial calibration mean relative response factor and the continuing calibration relative response factor for several compounds were outside the acceptance criteria of 25 percent. The compounds included N-nitroso-di-N-propylamine, 3-nitroaniline, 2,4-dinitrophenol, dibenzo (k) fluoranthene, di-N-octylphthalate, hexachlorocyclopentadiene, 2,4,6-trichlorophenol, 4-nitrophenol, 2,2-oxybis (1-chloropropane), pyrene, and/or benzo (b) fluoranthene. Some of these compounds are identified in the functional guidelines as historically exhibiting poor response and erratic behavior or because these corresponded to re-analyses and the primary results where within acceptance limits. In addition, the results were compared to previous quarters and the results were considered consistent.

Suspected laboratory contamination resulted in qualification of 60 sample results. The common laboratory contaminants bis (2-ethylhexyl) phthalate and diethylphthalate were frequently detected in the samples. In addition, an unknown phthalate and tentatively identified compound were detected in method blanks and samples for various SDGs. Although not always detected in the blanks associated with the samples, the phthalates are commonly attributed to laboratory contamination when detected at

low levels. All phthalates and unknown tentatively identified compounds detected at less than 10 times the reporting limit were qualified as nondetected estimated (UJb) for over 60 primary samples.

Technical holding times were met for the extraction and analysis of all samples with the exception of two samples. These sample results were re-extractions of original samples to confirm matrix affects. Although these re-extractions exceeded the holding times, the original results were reported on the final database and no data were qualified. One sample was qualified as detected estimated (Jh) and nondetected estimated (UJh) based on exceedence of cooler temperature criteria.

Minor surrogate recovery problems occurred in three samples, which required qualification as detected estimated (Ja) and nondetected estimated (UJa). In these cases, the problem was judged to have no detrimental impact on the quality of these samples for this project. Internal standard areas were within acceptance criteria for all samples.

Due to MS/MSD nonconformances, 13 samples were qualified as detected estimated (Jc) and nondetected estimated (UJc). As discussed in Section 3.1, MS/MSDs were not analyzed for every SDGs of water samples analyzed for SVOCs. Although this was a Groundwater Monitoring Plan, QAPP Addendum (PRC 1997A) and TtEMI Laboratory SOW (PRC 1995) protocol violation, the associated surrogates and the LCS recoveries were acceptable with the exceptions noted below. Although LCSs are not required under the CLP SOW, they were required by the TtEMI Laboratory SOW (PRC 1995) and the laboratory performed the analysis of these samples. The percent recoveries and RPDs were evaluated against CLP MS/MSD criteria and were within the criteria for QC limits with the exceptions described below. The recoveries for pentachlorophenol, acenaphthene, 4-nitrophenol, and pyrene were outside acceptance limits for two LCSs. For one of the LCS, which demonstrated a low bias, the associated 13 samples were qualified as detected estimated (Jc) and nondetected estimated (UJc). For the other LCS, the 4-nitrophenol, pentachlorophenol, and pyrene recoveries were biased high and the associated 10 samples were nondetected for these compounds. The data associated with this nonconformance did not require qualification.

For those SDGs with associated MS/MSD results, the recoveries and RPDs were within acceptance criteria with the exception noted below. In cases where recoveries or RPD exceed criteria, only one MS/MSD nonconformance required data to be qualified. Due to accuracy problems with 1,4-dichlorobenzene, one sample was qualified as nondetected estimated (UJc).

The RPD for different LCS pairs exceeded the control limits for acenaphthene, pentachlorophenol, 4-nitrophenol, and pyrene. Due to this QC problem, five samples were qualified as detected estimated (Jc) and nondetected estimated (UJc) for acenaphthene. In addition, the LCS recovery for pentachlorophenol, 4-nitrophenol, and pyrene was above control limits and the associated samples had no detectable concentrations of these analytes; therefore, these samples were not qualified.

The water field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

Target analytes detected below the reporting limits, but above the method detection limit, were qualified as estimated (Jg).

Due to quantitation problems, 12 samples were qualified as detected estimated (Jf). For these samples, the target analytes were present at high concentrations that exceeded the calibration range for the quantitation of that analyte. These samples were not diluted for concentrations of analytes, which exceeded the calibration range. As a result of this nonconformance, 12 sample results were qualified as detected estimated (Jf). These results were discussed in more detail where applicable in the data validation narratives (Appendix A).

4.2.3 Organochlorine Pesticides and PCBs

One sample had a total of 28 OC pesticide and PCB compound results qualified as rejected (Ra) due to surrogate recovery problems. Comparing the results for the previous four quarters to the results for these four quarters indicated that the values and analytes detected are consistent with previous results. A total of 28 OC pesticide and PCB compound results were qualified as rejected (R) out of 1,092 total results (97 percent complete); therefore, the completeness goal for this parameter was met.

Due to nonconformances with the initial calibration RPDs of the calibration factors for alpha BHC, gamma-BHC, 4,4-DDT, endosulfan, dieldrin, heptachlor, methoxychlor, and/or 4,4-DDE, 40 sample results were qualified as nondetected estimated (UJf).

No QC issues were associated with the blank samples for this analysis. Holding times were met for all samples with one exception. One sample (108-S02-104) was extracted 1 day beyond the 9-day holding time requirement. The associated results were qualified as nondetected estimated (UJh).

Minor surrogate recovery problems occurred in eight samples. In these cases, the data were qualified appropriately as detected estimated (Ja) and nondetected estimated (UJa). Internal standard areas were within acceptance criteria for all samples.

Due to LCS problems, one SDG had all samples qualified as nondetected estimated (UJc) for decachlorobiphenyl. As discussed in Section 3.1, MS/MSDs were not analyzed with every SDG of water samples analyzed for OC pesticides and PCBs. Although this is a Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) protocol violation, the associated surrogates and LCS recoveries were acceptable with two exceptions. One SDG had a LCS for low recovery of decachlorobiphenyl. The associated sample results were qualified as nondetected estimated (UJa). Another SDG had LCS RPDs that exceeded the acceptance limits for gamma-BHC and dieldrin. Since the individual LCS recoveries were within limits, no data were qualified for this SDG based on this nonconformance.

No data were qualified based on MS/MSD nonconformances. As discussed in Section 3.1, MS/MSDs were not analyzed for every SDG. For those SDGs with MS/MSD results, the recoveries and RPDs were evaluated against the acceptance criteria. In cases where recoveries or RPD exceeded criteria, the problem was judged to have no impact on the data quality and no qualifications were made.

Target analytes detected below the reporting limits, but above the method detection limits, were qualified as detected estimated (Jg).

The target analytes present at high concentrations that exceeded the calibration range for the quantitation of that analyte were diluted for quantitation. The samples were analyzed at a dilution to bring the concentration within the working calibration range. In these cases, the results of the high concentration analytes were retained from the analysis of the diluted sample and incorporated into the data from the analysis of the original sample. These results are discussed in more detail where applicable in the data validation narratives (Appendix A).

The water field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

The analysis of pesticides and PCBs required the use of two gas chromatography (GC) columns. Positive identification of analytes required the detection of the analyte on both GC columns. The concentrations were quantitated on each column and the laboratory was required to report the lower of the two values. When the percent difference between the two columns was greater than 25 percent, the laboratory flagged the data with a "P" qualifier. During data validation, these "P" qualifiers were replaced with a "J" qualifier to alert data users to potential problems in quantitating the analyte and the value was considered detected estimated (J).

Due to confirmation problems, three samples were qualified for heptachlor epoxide as detected estimated (Jh).

4.2.4 Total Purgeable Petroleum Hydrocarbons

All 124 TPPH data results were valid with no data points rejected. The completeness objective was met for this analysis. Initial and continuing calibration standards met the criteria for this analysis. No TPPHs were detected in the associated blank samples. Holding times were met for all samples for TPPH analysis. However, due to cooler temperatures that were reported between 4.7 to 15.8°C at the time of sample log-in by the laboratory, 12 samples were qualified as detected estimated (Jh) and nondetected estimated (UJh).

Minor surrogate recovery problems were detected for this analysis; therefore, six samples were qualified as estimated (Ja). MS/MSD and LCS results met the criteria for this method.

The groundwater field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

Due to gasoline standard pattern match problems, the detected results were either qualified as estimated (Jy or Jz) during the data validation process. The "y" comment code is used to indicate the sample

pattern observed in the sample and the result indicates the presence of petroleum hydrocarbons. The "z" commment code is used to indicate that the sample results do not match the standard fuel pattern. The GC pattern in the samples qualified with detected estimated (Jz) did not show a reasonable match to the gasoline standard used for calibration.

Target analytes detected below the reporting limits, but above the method detection limits, were qualified as detected estimated (Jg).

4.2.5 Total Extractable Petroleum Hydrocarbons

All TEPH data were valid with no primary results rejected with the exception of six samples. Based on method blank contamination for TEPH, two of these samples were rejected (Rb). Due to other nonconformances, four TEPH sample results were qualified as rejected (Rh). Comparing the results for the previous four quarters to results for these four quarters, indicated that the values detected are consistent with previous results. A total of 10 TEPH results (diesel and motor oil) were qualified as rejected (R) out of 246 total results (96 percent complete); therefore, the completeness goal for this parameter was met.

Initial and continuing calibration standards met the criteria for this analysis with one exception. Due to the continuing calibration percent difference not meeting the acceptance criteria, the results for eight samples were qualified as detected estimated (Jf) and nondetected estimated (UJf) for TPH as motor oil.

Due to method blank contamination, the three associated samples were qualified as nondetected estimated (UJb) when detectable concentrations were less than five times the amount detected in the associated blanks.

Holding times were met for all primary samples for TEPH analysis. However, 15 samples were re-extracted between 3 and 29 days past the holding time, including one re-extracted sample that was re-extracted a second time 25 days past holding time for this analysis. The primary results were retained in the database. The re-extracted sample results were qualified as detected estimated (Jh) and nondetected estimated (UJh).

Due to cooler temperature that were reported between 4.7 and 15.8°C at the time of sample log-in by the laboratory, 18 samples were qualified as detected estimated (Jh) and nondetected estimated (UJh).

Surrogate recoveries were below the acceptance criteria for 30 primary samples. Many of the associated re-extracted samples had similar surrogate recoveries, which confirms potential matrix interferences. The sample results were qualified as nondetected estimated (UJa).

Due to MS/MSD problems, nine samples were qualified as nondetected estimated (UJc). As discussed in Section 3.1, MS/MSDs were not analyzed with every SDGs of water samples analyzed for TEPH. Although this is a Groundwater Monitoring Plan, QAPP Addendum (PRC 1997a) protocol violation, the associated surrogates (except for two samples) were acceptable; therefore, no data required qualification. For those SDGs with MS/MSDs reported, the recoveries and RPDs were evaluated against the acceptance criteria. In cases where recoveries were below the criteria, the data the associated nine samples were qualified as nondetected estimated (UJc).

Although LCSs are not required under the CLP SOW or the TtEMI Laboratory SOW (PRC 1995), the laboratory performed the analysis of these samples. The percent recoveries and RPDs were evaluated against CLP MS/MSD criteria and were within the criteria with QC limits with 19 exceptions. For those samples associated with a LCS which had low recoveries below the acceptance limits, the results were qualified as detected estimated (Jc) and nondetected estimated (UJc) for 52 samples.

The water field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

Due to diesel standard pattern match problems, the detected results were either qualified as estimated (Jy or Jz) during the data validation process. The "y" comment code is used to indicate that the sample pattern observed in the sample the result indicates the presence of petroleum hydrocarbons. The "z" comment code is used to indicate that the sample results do not match the standard fuel pattern. The GC pattern in the samples qualified with detected estimated (Jz) did not show a reasonable match to the diesel standard used for calibration.

Target analytes detected below the reporting limits, but above the method detection limits, were qualified as detected estimated (Jg).

In one SDG, the reported detection limit for TEPH was 0.25 milligram per liter (mg/L) and the required reporting limit was 0.1 mg/L. This nonconformance did not have a detrimental impact on the data quality.

4.2.6 Metals

Although the majority of metals data were considered valid, results for lead and/or selenium were rejected (Rc) in 83 sample results, due to severe MS recovery problems. These results are discussed in more detail where applicable in the data validation narratives (Appendix A). Table 3 provides a list of the sample numbers with rejected results and the basis for rejection. A total of 83 metals results were qualified as rejected (Rc). The rejection of these analytes is not expected to have a detrimental impact on the quality of the other results for this project. Comparing the results for the previous four quarters to the results for these four quarters indicated that the values and analytes detected are consistent with previous results. A total of 83 metals results were qualified as rejected (R) out of 9,336 total results (99 percent complete); therefore, the completeness goal for this parameter was met.

Calibration standards met the criteria for this analysis with the exception aluminum, cadmium, copper, and iron. Due to calibration problems, 134 samples were qualified as detected estimated (Jf) and nondetected estimated (UJf).

A total of 375 sample results were qualified due to blank contamination problems. Results were qualified due to contamination of the initial calibration blanks (ICB), continuing calibration blanks (CCB), preparation blanks (PB), or field blanks and equipment blanks. Sample results of concentrations less than five times the concentration found in the associated blanks were qualified. The reported contaminants included the following: aluminum, antimony, arsenic, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, thallium, vanadium, molybdenum, and zinc.

Equipment rinsates were not always free from target analyte contamination. Equipment rinsates were commonly contaminated with ubiquitous analytes, such as sodium, iron, manganese, and zinc. When appropriate, the associated sample results were qualified based on equipment rinsate contamination. The analytical holding times were met for all metals for all samples.

Although assessed to be valid, samples were qualified as detected estimated (Jc) or nondetected estimated (UJc) due to MS recovery (261 samples), serial dilution (288 samples), and analytical spike/post-digestion spike (65 samples) nonconformances. The analytes that were affected included copper, iron, lead, nickel, potassium, selenium, silver, sodium, and thallium. The interference check standard did not contain molybdenum in one SDG; therefore, the two associated samples were qualified as detected estimated (Jh). Due to interference check standard problems, results for antimony, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, vanadium, and/or zinc in 31 samples were qualified as detected estimated (Jh) and nondetected estimated (UJh). These QC issues are discussed in more detail where applicable in the data validation narratives (Appendix A).

No recovery problems were associated with any of the LCSs for this analysis, with the exception of silver for three SDGs. Based on LCS low recoveries, the results for 48 samples were qualified as detected estimated (Jc) and nondetected estimated (UJc) for silver.

The water field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

The CRDL standards are used to verify linearity near the CRDL for metal analyses. Poor recoveries of this standard suggest a decrease in sensitivity at the CRDL. Although functional guidelines provide no guidance as to the evaluation of the CRDL standards, TtEMI instituted control limits of 75 percent for qualification as estimated nondetected (UJf) and 50 percent for rejection (Rf) of nondetected results. No problems associated with the CRDL standards required qualifications.

Analytes that were detected at concentrations greater than the instrument detection limit, but less than the CRDL, were qualified as estimated (Jg).

Spectral interferences were detected for three samples and the results were qualified as detected estimated (Jh) and nondetected estimated (UJh) for antimony, beryllium, cadmium, chromium, cobalt, lead, molybdenum, nickel, silver, selenium, vanadium, and zinc.

4.2.7 General Chemical Parameters

The general chemical parameters include alkalinity, common anions, sulfide, nitrate/nitrite as nitrogen, TDS, and total organic carbon (TOC). All general chemical parameter data were valid with no results rejected with the exception of sulfate analysis. A total of three sulfate results were qualified as rejected (Rc) due to severe MS recoveries. Comparing the results for the previous four quarters to the results for these four quarters indicated that the values and analytes detected are consistent with previous results. A total of three sulfate results were qualified as rejected (R) out of 2,457 total results (99 percent complete); therefore, the completeness goal for this parameter was met.

The laboratory experienced 65 QC problems for the various analyses. These problems are discussed in more detail where applicable in the data validation narratives (Appendix A). All initial and continuing calibrations met the criteria with the following exceptions. Based on the continuing calibration verification problems, phosphate results in the three associated samples were qualified as non-detected estimated (UJf). Based on calibration verification standard problems, results for TOC (12 samples), chloride (15 samples), sulfate (three samples), and nitrite (two samples) were qualified as detected estimated (J) and nondetected estimated (UJf).

Due to method blank contamination, the two associated sample results less than five times the maximum blank contamination of TOC detected were qualified as nondetected estimated (UJb). Due to method blank contamination, results in six samples for chloride, two samples for phosphate, two samples for sulfide, and one sample for TDS were qualified as nondetected estimated (UJb). Due to equipment rinsate and method blank contamination, sample results were qualified as nondetected estimated (UJb) for nitrate (one sample) and sulfate (one sample) detected less than five times the maximum blank contamination.

Holding times were met for all samples for these analyses with the exception of TDS (20 samples) nitrate/nitrite (69 samples), phosphate (50 samples), and sulfide (two samples). Because the samples

were analyzed outside the required holding times for these analyses, the results were qualified as detected estimated (J) and nondetected estimated (UJh).

The MS/MSD recovery results were within acceptance criteria with the exceptions noted below. Due to MS recovery and precision problems, results in different SDGs were qualified as detected estimated (Jc or Jd) for alkalinity (two samples), bromide (60 samples), chloride (40 samples), fluoride (nine samples), TOC (one sample), phosphate (25 samples), sulfate (19 samples), and sulfide (57 samples). The associated LCS results were within acceptance criteria for all samples for these analyses. Due to severe MS recoveries, the results for 16 samples were qualified as detected estimated (Jc or Jd).

Due to LCS recovery problems, eight samples for TOC, four samples for fluoride, and 15 samples for sulfide were qualified as detected estimated (Jc).

The groundwater field duplicate samples were evaluated for acceptable precision with RPDs for the analytes. The associated data validation narratives presented details regarding criteria exceeded. Sample data were not qualified on the basis of field duplicate precision.

The reported detection limits for sulfide in four SDGs were not consistent with TtEMI's required reporting limits. The laboratory reported detection limit was 1.0 mg/L for sulfide and 0.10 mg/L for phosphate. The required reporting limits were 0.01 mg/L for sulfide and 0.05 mg/L for phosphate. This problem was judged to have no detrimental impact on the quality of these samples for this project.

In one instance, a sample was not diluted for concentrations of chloride, which exceeded the calibration range. In this case, the sample results were qualified as detected estimated (Jh). This result is discussed in more detail in the data validation narrative (Appendix A).

REFERENCES

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EPA. 1994a. "Data Quality Objectives for Remedial Response Activities Development Process." EPA QA/G-4. Prepared by the Office of Emergency Response and Office of Waste Programs Enforcement. September.

EPA. 1994b "U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review." February.

EPA. 1994c. "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review." February.

TABLES

QUALITY CONTROL SUMMARY REPORT QUARTERLY GROUNDWATER MONITORING NOVEMBER 1997 – AUGUST 1998

DATED 1 FEBRUARY 1999

TABLE 1

DATA VALIDATION REQUIREMENTS
ALAMEDA POINT

CLP Inorganics[a]
*Holding times
*Calibration (initial and continuing)
*Blanks (method, instrument, and preparation blanks)
Inductively coupled plasma interference check sample
*Laboratory control sample
*Duplicate sample analysis
*Matrix spike (MS) sample analysis
Graphite furnace atomic absorption quality control (QC)
ICP serial dilution
Sample result verification
*Field duplicates
*Overall assessment of data for a sample delivery group (SDG)
CLP Organics[b]
*Holding times
Gas chromatograph/mass spectrometer tuning
*Calibration (initial and continuing)
*Blanks (method, instrument, and preparation blanks)
*Surrogate recovery
*Matrix spike/matrix spike duplicate (MS/MSD)
*Field duplicates
*Internal standard performance
Target compound identification
Tentatively identified compounds
System performance
*Overall assessment of data for an SDG
Non-CLP Organics and Inorganics Parameters
*Method compliance
*Holding times
*Calibration (initial and continuing)
*Blanks (method, instrument, and preparation blanks)
*Surrogate recovery
*Sample duplicates, MSs, MSDs, blank spikes
*Other laboratory QC specified by the method
*Field duplicates
Detection limits
Compound identification
Compound quantitation
Sample result verification
*Overall assessment of data for an SDG

Notes:

a	"U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review." February 1994.
b	"U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review." February 1994.
*	Items listed are evaluated by cursory review. Remaining items listed are evaluated during a full validation review.
CLP	Contract Laboratory Program
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SDG	Sample Delivery Group
QC	Quality Control

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW01
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Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					OP/PCB	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-001	Water	10/29/97	Trip blank																	X
108-S01-003	Water	10/29/97	MS/DUP			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-004	Water	10/29/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S01-005	Water	10/29/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S01-010	Water	10/29/97	MS/MSD			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-011	Water	10/29/97	MS/MSD			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-015	Water	10/29/97				X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-001	Water	10/30/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-002	Water	10/30/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-004	Water	10/30/97				X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-005	Water	10/30/97	Duplicate of sample 108-S02-004													X	X			X
108-S02-006	Water	10/29/97	MS/DUP			X	X	X	X	X	X	X	X	X	X		X			X
108-S02-007	Water	10/29/97				X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-010	Water	10/29/97		Full	X	X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-012	Water	10/29/97	MS/DUP			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-019	Water	10/30/97	MS/DUP			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-020	Water	10/30/97		Full	X	X	X	X	X	X	X	X	X	X	X	X	X			X
108-S02-022	Water	10/30/97				X	X	X	X	X	X	X	X	X	X	X	X			X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW02

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					TOC	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-002	Water	10/30/97	Trip blank																	X
108-S00-003	Water	11/3/97	Trip blank																	X
108-S01-001	Water	10/30/97		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-002	Water	10/30/97	Duplicate of sample 108-S01-001													X	X	X	X	X
108-S01-012	Water	10/30/97	MS/MSD/DUP			X	X	X	X	X	X	X	X	X	X		X			X
108-S02-015	Water	10/30/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S03-001	Water	11/3/97		Full	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S03-002	Water	11/3/97	MS/DUP		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S03-003	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S04-001	Water	11/3/97	MS/MSD		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-002	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-003	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-007	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-001	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-002	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-003	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-004	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-008	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-009	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-010	Water	11/3/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-012	Water	11/3/97	MS/MSD		X	X	X	X	X	X	X	X	X	X	X		X			X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW03

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					TOC	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-004	Water	11/4/97	Trip blank																	X
108-S01-007	Water	11/4/97	MS/MSD/DUP	Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-008	Water	11/4/97	MS/MSD/DUP			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-012	Water	11/4/97	MS/MSD			X	X	X	X	X	X	X	X	X	X		X			X
108-S02-008	Water	11/5/97	MS/MSD			X	X	X	X	X	X	X	X	X		X	X			X
108-S02-013	Water	11/5/97		Full		X	X	X	X	X	X	X	X	X		X	X			X
108-S05-005	Water	11/4/97		Full	X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-006	Water	11/4/97	MS/DUP		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-007	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-011	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-015	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S05-016	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S06-001	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S10-001	Water	11/4/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S11-001	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S11-002	Water	11/5/97	MS/MSD		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S11-003	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S11-004	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S11-005	Water	11/5/97	Duplicate of sample 108-S11-004			X	X	X	X	X	X	X	X				X			X
108-S21-001	Water	11/5/97	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X	X		X			X
	Water																			

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW04

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses																
					TOC	OP/PCB	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-005	Water	11/5/97	Trip blank																		X
108-S00-006	Water	11/6/97	Trip blank																		X
108-S02-003	Water	11/6/97					X	X	X	X	X	X	X	X	X	X		X			X
108-S07-001	Water	11/6/97			X		X	X	X	X	X	X	X	X	X	X		X			X
108-S07-003	Water	11/4/97	MS/MSD		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S07-004	Water	11/5/97			X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S07-005	Water	11/5/97	Duplicate sample of 108-S07-004															X	X	X	X
108-S07-006	Water	11/6/97	MS/MSD		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S09-001	Water	11/5/97	MS/DUP		X		X	X	X	X	X	X	X	X	X	X		X			X
108-S09-002	Water	11/5/97	Duplicate sample of 108-S09-001															X			X
108-S12-001	Water	11/6/97			X		X	X	X	X	X	X	X	X	X	X		X			X
108-S13-001	Water	11/6/97	MS/MSD/DUP	Full	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S13-002	Water	11/6/97	MS/MSD		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S99-001	Water	11/6/97	Field blank/MS/DUP		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S99-002	Water	11/6/97	Equipment rinsate		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-SBG-001	Water	11/5/97	MS/DUP	Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-SBG-002	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
108-SBG-003	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-SBG-004	Water	11/5/97			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-SBG-100	Water	11/6/97				X														X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW05
Page 5 of 24

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					TOC	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-007	Water	11/7/97	Trip blank																	X
108-S00-008	Water	11/10/97	Trip blank																	X
108-S01-013	Water	11/7/97		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S02-014	Water	11/10/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-017	Water	11/7/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-018	Water	11/7/97															X			X
108-S02-021	Water	11/10/97				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-100	Water	11/7/97													X					
108-S02-101	Water	11/7/97													X					
108-S04-005	Water	11/7/97			X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-006	Water	11/6/97	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-008	Water	11/6/97	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X	X		X			X
108-S04-009	Water	11/6/97	Duplicate of sample 108-S04-008														X			X
108-S13-003	Water	11/7/97			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S13-004	Water	11/7/97	Duplicate of sample 108-S13-003														X	X	X	X
108-S14-001	Water	11/7/97		Full	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S19-001	Water	11/10/97			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S22-001	Water	11/7/97			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S22-002	Water	11/7/97			X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S23-002	Water	11/6/97	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW06

					Analyses																
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	TOC	OP/PCB	ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-009	Water	11/11/97	Trip blank																		X
108-S00-010	Water	11/13/97	Trip blank																		X
108-S00-100	Water	11/13/97	Trip blank																		X
108-S01-014	Water	11/14/97			X		X	X	X	X	X	X	X	X	X	X		X			X
108-S02-009	Water	11/10/97		Full			X	X	X	X	X	X	X	X	X	X	X***	X			X
108-S02-011	Water	11/13/97	MS/MSD/DUP				X	X	X	X	X	X	X	X	X	X		X			X
108-S02-016	Water	11/10/97																X			X
108-S02-102	Water	11/11/97					X	X	X	X	X	X	X	X	X						
108-S02-103	Water	11/13/97		Full													X***				
108-S02-104	Water	11/13/97		Full		X***															
108-S02-105	Water	11/14/97														X					
108-S04-004	Water	11/14/97			X		X	X	X	X	X	X	X	X	X	X		X			X
108-S05-013	Water	11/13/97	MS/MSD		X		X	X	X	X	X	X	X	X	X	X		X			X
108-S05-014	Water	11/13/97	Duplicate of sample 108-S05-013															X			X
108-S07-002	Water	11/11/97	MS/MSD/DUP		X		X	X	X	X	X	X	X	X	X	X		X			X
108-S09-003	Water	11/11/97			X		X	X	X	X	X	X	X	X	X	X		X			X
108-S16-001	Water	11/11/97	MS/MSD/DUP		X		X	X	X	X	X	X	X	X	X	X		X			X
108-S16-002	Water	11/11/97	Duplicate of sample 108-S16-001															X			X
108-S22-003	Water	11/11/97	MS/DUP	Full	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S22-004	Water	11/10/97	MS/DUP	Full	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S23-001	Water	11/13/97			X		X	X	X	X	X	X	X	X	X	X		X			X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW07
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Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses														
					ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-011	Water	2/3/98	Trip blank																X
108-S00-012	Water	1/28/98	Trip blank																X
108-S01-016	Water	2/4/98			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-017	Water	2/4/98			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-018	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-019	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-020	Water	2/3/98	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X	X**	X**	X**	X**	X**
108-S01-021	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S01-022	Water	2/3/98		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-023	Water	2/4/98	MS/DUP		X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-027	Water	2/4/98	MS/DUP	Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-028	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-010	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-011	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-012	Water	2/4/98	Duplicate of sample 108-S04-11													X			X
108-S05-017	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-018	Water	2/4/98	Duplicate of sample 108-S05-17													X			X
108-S07-007	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S09-004	Water	2/4/98	MS/DUP		X	X	X	X	X	X	X	X	X	X		X			X
108-S22-005	Water	2/4/98	MS/DUP		X	X	X	X	X	X	X	X	X	X		X**	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW08

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses														
					ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-013	Water	2/3/98	Trip blank																X
108-S01-024	Water	1/28/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-025	Water	2/4/98	Duplicate of sample 108-S01-024													X			X
108-S05-019	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-020	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-021	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-022	Water	2/3/98	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X		X			X
108-S05-023	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-024	Water	2/3/98	MS/DUP		X	X	X**	X	X	X	X	X	X	X		X			X
108-S05-025	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-026	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-027	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S07-008	Water	2/4/98		Full	X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S07-009	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S07-010	Water	2/4/98	Duplicate of sample 108-S04-009													X	X	X	X
108-S07-011	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S07-012	Water	2/4/98		Full												X	X	X	X
108-S09-005	Water	2/4/98	MS/DUP		X	X	X	X	X	X	X	X	X	X		X**			X
108-S09-006	Water	2/4/98	Duplicate of sample 108-S09-006													X			X
108-S10-002	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW09

					Analyses															
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC	SVOC	OP/PCB	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	NITRATE	NITRITE	O-PO4	SULFIDE	FLUORIDE	TDS	SULFATE
108-S00-014	Water	2/6/98	Trip blank		X			X			X	X	X	X	X	X	X	X	X	X
108-S03-005	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S03-006	Water	2/6/98	MS/DUP**	Full	X			X	X	X	X	X**	X**	X**	X**	X**	X	X	X	X
108-S04-016	Water	2/9/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S04-017	Water	2/9/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S04-018	Water	2/9/98	MS/MSD/DUP**		X**			X**			X**	X	X	X	X	X	X**	X**	X**	X
108-S04-019	Water	2/9/98	MS/DUP**		X			X			X	X	X**	X**	X**	X**	X	X	X	X
108-S05-028	Water	2/6/98	MS/DUP**		X			X**			X	X	X	X	X	X	X	X	X**	X
108-S05-029	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S05-030	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S05-031	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S05-032	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S06-002	Water	2/6/98	DUP**		X			X			X**	X	X	X	X	X	X	X	X	X
108-S11-006	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S11-008	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S11-009	Water	2/6/98			X			X												
108-S11-010	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S16-003	Water	2/6/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S16-004	Water	2/6/98			X			X												
108-S23-004	Water	2/6/98		Full	X			X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW10

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					VOC	SVOC	OP/PCB	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	NITRATE	NITRITE	O-PO4	SULFIDE	FLUORIDE	TDS	SULFATE
108-S00-015	Water	2/9/98	Trip blank		X															
108-S00-016	Water	2/10/98	Trip blank		X															
108-S01-026	Water	2/10/98	MS/DUP**		X			X**			X	X	X	X	X	X	X	X	X	X
108-S02-024	Water	2/10/98	MS/DUP**		X			X			X	X	X**	X	X	X	X	X	X	X**
108-S02-032	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-033	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-034	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-042	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-044	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S03-004	Water	2/10/98			X			X	X	X	X	X	X	X	X	X		X	X	X
108-S04-013	Water	2/9/98	MS/DUP**		X			X			X	X	X	X	X	X	X**	X	X	X
108-S04-014	Water	2/9/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S04-015	Water	2/9/98	MS/DUP**		X			X**			X	X	X	X	X	X	X	X	X	X**
108-S11-007	Water	2/9/98	MS/DUP**		X			X**			X	X	X	X	X	X	X	X	X	X
108-S12-002	Water	2/9/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S13-005	Water	2/10/98	MS/DUP**	Full	X	X		X	X	X	X	X**	X**	X**	X**	X**	X	X	X	X**
108-S13-006	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S13-007	Water	2/10/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S13-008	Water	2/10/98	Duplicate of sample 108-S13-007		X			X	X	X										
108-SBG-008	Water	2/11/98		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X**	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW11

					Analyses															
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC	SVOC	OP/PCB	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	NITRATE	NITRITE	O-PO4	SULFIDE	FLUORIDE	TDS	SULFATE
108-S00-017	Water	2/11/98	Trip blank		X															
108-S00-018	Water	2/12/98	Trip blank		X															
108-S02-025	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-026	Water	2/11/98	MS/DUP**		X			X**			X**	X	X	X	X	X	X	X	X	X
108-S02-027	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-028	Water	2/11/98	Duplicate of sample 108-S02-007		X					X										
108-S02-029	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-030	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-031	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-037	Water	2/12/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S14-002	Water	2/11/98		Full	X			X			X	X	X	X	X	X	X	X	X	X
108-S22-006	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S22-007	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S22-008	Water	2/11/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S23-003	Water	2/12/98	MS/DUP**		X			X			X	X	X	X	X	X	X	X	X	X**
108-S99-003	Water	2/12/98	Field blank		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S99-004	Water	2/12/98	Equipment rinsate		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-SBG-005	Water	2/11/98	MS/MSD/DUP**		X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**	X**
108-SBG-006	Water	2/11/98		Full	X			X			X	X	X	X	X	X	X	X	X	X
108-SBG-007	Water	2/11/98		Full***	X	X***	X***	X	X	X	X	X	X	X	X	X	X	X	X	X
					X			X			X	X	X	X	X	X	X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW12
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					Analyses															
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC	SVOC	OP/PCB	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	NITRATE	NITRITE	O-PO4	SULFIDE	FLUORIDE	TDS	SULFATE
108-IDW-001	Water	2/13/98		Full***	X	X***	X	X	X***	X***										
108-IDW-002	Water	2/13/98		Full***	X	X***	X***	X	X	X										
108-S00-019	Water	2/13/98	Trip blank		X															
108-S02-035	Water	2/12/98			X		X	X			X	X	X	X	X	X	X	X	X	X
108-S02-036	Water	2/12/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-038	Water	2/13/98		Full	X		X	X			X	X	X	X	X	X	X	X	X	X
108-S02-039	Water	2/13/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-040	Water	2/13/98			X			X												
108-S02-041	Water	2/13/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S02-043	Water	2/13/98			X			X			X	X	X	X	X	X	X	X	X	X
108-S19-002	Water	2/12/98	MS/MSD/DUP**	Full	X**			X**	X**	X**	X	X**	X**	X**	X**	X**	X**	X**	X**	X**
108-S21-002	Water	2/13/98	MS/DUP**		X			X			X	X**	X**	X**	X**	X**	X	X	X	X**

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW13

					Analyses					
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC OLC02.1	SVOC	OP/PCB	METALS	TPPH	TEPH
108-S01-029	Water	5/4/98		Full***	X	X***		X		
108-S01-031	Water	5/4/98			X			X		
108-S01-033	Water	5/4/98			X	X		X	X	X
108-S01-035	Water	5/4/98		Full***	X	X***		X	X	X
108-S07-016	Water	5/4/98			X			X	X	X
108-S07-022	Water	5/4/98		Full	X			X	X	X
108-S00-021	Water	5/4/98	Trip blank		X					
108-S00-022	Water	5/5/98	Trip blank		X					
108-S01-034	Water	5/5/98			X			X	X	X
108-S04-024	Water	5/5/98			X			X		
108-S07-015	Water	5/5/98			X			X	X	X
108-S07-023	Water	5/5/98			X			X	X	X
108-S99-005	Water	5/5/98	Field blank		X	X	X	X	X	X
108-S99-006	Water	5/5/98	Equipment rinsate		X	X	X	X	X	X
108-S07-017	Water	5/5/98			X			X		
108-S04-022	Water	5/5/98			X			X		
108-S07-018	Water	5/6/98			X			X	X	X
108-S04-023	Water	5/6/98	MS/DUP**		X			X**		
108-S04-046	Water	5/6/98		Full	X			X	X	X
108-S04-025	Water	5/6/98	MS/MSD/DUP		X			X		

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW14

					Analyses					
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC OLC02.1	SVOC	METALS	TPPH	TEPH	
108-S13-009	Water	5/6/98		Full	X	X	X	X	X	
108-S04-026	Water	5/6/98	MS/MSD/DUP**		X**		X**			
108-S00-023	Water	5/6/98	Trip blank		X					
108-S04-021	Water	5/6/98			X		X			
108-S04-029	Water	5/6/98			X		X			
108-S01-036	Water	5/6/98			X	X	X			
108-S01-037	Water	5/6/98	Duplicate of sample 108-S01-036		X	X	X			
108-S05-039	Water	5/7/98			X		X			
108-S01-041	Water	5/7/98			X		X			
108-S05-043	Water	5/7/98			X		X			
108-S01-040	Water	5/7/98		Full	X	X	X	X	X	
108-S05-035	Water	5/7/98			X		X			
108-S05-042	Water	5/7/98			X		X			
108-S05-036	Water	5/7/98			X		X			
108-S00-024	Water	5/7/98	Trip blank		X					
108-S02-065	Water	5/7/98			X		X			
108-S02-061	Water	5/7/98			X		X			
108-S02-062	Water	5/7/98	Duplicate of sample 108-S02-061		X		X			
108-S02-058	Water	5/7/98			X		X			
108-S02-055	Water	5/7/98			X		X			

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW15

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses					
					VOC OLC02.1	SVOC	METALS	TPPH	TEPH	
108-S02-045	Water	5/8/98	MS/DUP**		X		X**			
108-S02-046	Water	5/8/98	MS/DUP**		X		X**			
108-S02-050	Water	5/8/98			X		X			
108-S02-051	Water	5/8/98			X	X	X			
108-S02-052	Water	5/8/98		Full***	X	X***	X			
108-S04-020	Water	5/8/98			X		X			
108-S00-025	Water	5/8/98	Trip blank		X					
108-S05-041	Water	5/8/98	MS/DUP**		X		X**			
108-S05-038	Water	5/8/98			X		X			
108-S05-033	Water	5/8/98			X		X			
108-S05-034	Water	5/8/98	Duplicate of sample 108-S05-033		X		X			
108-S04-045	Water	5/8/98	MS/MSD**	Full	X		X	X**	X	
108-S02-056	Water	5/11/98			X	X	X			
108-S02-059	Water	5/11/98			X		X			
108-S02-066	Water	5/11/98		Full***	X	X***	X			
108-S03-009	Water	5/11/98			X		X	X	X	
108-S03-007	Water	5/11/98		Full	X		X	X	X	
108-S03-008	Water	5/11/98			X		X			
108-S00-026	Water	5/11/98	Trip blank		X					
108-S02-063	Water	5/11/98			X	X	X			

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW16

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses					
					VOC OLC02.1	SVOC	OP/PCB	METALS	TPPH	TEPH
108-S02-060	Water	5/11/98		Full	X	X	X			
108-S02-053	Water	5/11/98	MS/DUP**		X			X**		
108-S05-047	Water	5/11/98	MS/DUP**		X			X**		
108-S05-048	Water	5/11/98	MS/DUP**		X			X**		
108-S06-003	Water	5/12/98			X			X		
108-S09-009	Water	5/12/98			X			X		
108-S10-003	Water	5/12/98			X			X		
108-S11-014	Water	5/12/98			X			X		
108-S11-015	Water	5/12/98	Duplicate of sample 108-S11-014		X			X		
108-S11-013	Water	5/12/98			X			X		
108-S11-011	Water	5/12/98			X			X		
108-S11-012	Water	5/12/98			X			X		
108-S12-003	Water	5/12/98			X			X		
108-S13-010	Water	5/12/98		Full***	X			X	X***	X***
108-S00-027	Water	5/12/98	Trip blank		X					
108-S02-106	Water	5/12/98		Full				X		
108-S07-013	Water	5/12/98			X			X		
108-S07-014	Water	5/12/98	Duplicate if sample 108-S07-013		X			X		
108-S07-020	Water	5/12/98		Full	X			X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW17

					Analyses					
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC OLC02.1	METALS	TPPH	TEPH		
108-S07-021	Water	5/12/98	Duplicate of sample 108-S07-019		X	X	X	X		
108-S07-019	Water	5/13/98		Full	X	X	X	X		
108-S19-003	Water	5/13/98			X	X	X	X		
108-S14-003	Water	5/13/98			X	X	X	X		
108-S13-011	Water	5/13/98			X	X	X	X		
108-S13-012	Water	5/13/98	Duplicate of sample 108-S13-011		X	X	X	X		
108-S21-003	Water	5/13/98			X	X				
108-S22-011	Water	5/13/98			X	X	X	X		
108-S23-006	Water	5/13/98			X	X	X	X		
108-S22-012	Water	5/13/98	MS/MSD/DUP		X	X	X	X		
108-S09-007	Water	5/13/98			X	X				
108-S09-008	Water	5/13/98	Duplicate of sample 108-S09-007		X	X				
108-S00-028	Water	5/13/98	Trip blank		X					
108-S04-043	Water	5/13/98		Full	X	X	X	X		
108-S04-044	Water	5/13/98	Duplicate of sample 108-S04-043		X	X	X	X		
108-S05-045	Water	5/13/98			X	X				
108-S05-046	Water	5/13/98			X	X				
108-S05-040	Water	5/13/98			X	X				
108-S05-044	Water	5/13/98			X	X				
108-S23-005	Water	5/13/98			X	X				

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW18
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Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses					
					VOC OLC02.1	SVOC	OP/PCB	METALS	TPPH	TEPH
108-SBG-009	Water	5/14/98	MS/MSD/DUP	Full***	X	X	X	X	X**,***	X**,***
108-SBG-010	Water	5/14/98		Full	X	X	X	X	X	X
108-SBG-012	Water	5/14/98			X	X	X	X	X	X
108-SBG-011	Water	5/14/98			X	X	X	X	X	X
108-S05-037	Water	5/14/98			X			X		
108-S00-029	Water	5/14/98	Trip blank		X					
108-S22-009	Water	5/14/98			X			X		
108-S02-054	Water	5/14/98			X	X	X	X		
108-S02-057	Water	5/14/98			X	X	X	X		
108-S02-064	Water	5/14/98		Full	X	X	X	X		
108-S01-032	Water	5/14/98			X			X		
108-S04-027	Water	5/14/98			X			X		
108-S04-028	Water	5/14/98	Duplicate of sample 108-S04-027		X			X		

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW19
Page 19 of 24

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses															
					VOC OLC02.1	SVOC	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	FLUORIDE	NITRITE	NITRATE	SULFATE	O-PO4	SULFIDE	TDS
108-S01-045	Water	8/3/98	MS/DUP**	Full	X	X	X**	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-044	Water	8/3/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S01-042	Water	8/3/98	MS/MSD**		X**	X	X			X	X	X	X	X	X	X	X	X	X
108-S01-043	Water	8/3/98	MS/MSD**		X		X			X	X	X	X	X	X	X	X	X**	X
108-S01-047	Water	8/3/98		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-048	Water	8/3/98			X	X	X			X	X	X	X	X	X	X	X	X	X
108-S01-049	Water	8/3/98	Duplicate of sample 108-S01-048		X	X	X												
108-S01-050	Water	8/3/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-051	Water	8/3/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S00-031	Water	8/3/98	Trip blank		X														
108-S04-036	Water	8/4/98	MS/MSD**		X		X			X	X**	X**	X**	X**	X**	X**	X	X	X
108-S04-035	Water	8/4/98	MS/DUP**		X		X			X**	X	X	X	X	X	X	X	X	X
108-S04-033	Water	8/4/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S04-037	Water	8/4/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S04-034	Water	8/4/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S00-032	Water	8/4/98	Trip blank		X														
108-S01-046	Water	8/4/98	MS/DUP**		X		X**	X	X	X	X**	X	X**	X**	X**	X	X**	X	X**
108-S03-012	Water	8/4/98			X		X	X	X	X	X	X	X	X	X	X	X	X	X
108-S03-011	Water	8/4/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S03-010	Water	8/4/98			X		X	X	X	X	X	X	X	X	X	X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW20

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses													
					VOC OLC02.1	METALS	TPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	FLUORIDE	NITRITE	NITRATE	SULFATE	O-PO4	SULFIDE	TDS
108-S04-038	Water	8/5/98	MS/MSD/DUP**		X	X**			X	X**	X**	X**	X	X**	X**	X**	X	X
108-S04-039	Water	8/5/98	Duplicate of sample 108-S04-038		X	X												
108-S04-040	Water	8/5/98	MS/DUP**	Full	X	X**			X	X	X	X	X	X	X	X	X	X
108-S05-051	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-052	Water	8/5/98	MS/DUP**		X	X**			X	X	X	X	X	X	X	X	X	X
108-S05-053	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-054	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-055	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-056	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-057	Water	8/5/98	MS/DUP**		X	X			X**	X	X	X	X	X	X	X	X	X
108-S05-058	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S04-032	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-049	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-050	Water	8/5/98	Duplicate of sample 108-S05-049		X	X												
108-S04-031	Water	8/5/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S04-030	Water	8/5/98	MS/DUP**	Full	X	X	X	X	X**	X	X**	X	X	X	X	X	X	X
108-S00-033	Water	8/5/98	Trip blank		X													

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW21

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses													
					VOC OLC02.1	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	FLUORIDE	NITRITE	NITRATE	SULFATE	O-PO4	SULFIDE	TDS
108-S05-059	Water	8/6/98	MS/MSD/DUP		X	X			X	X	X	X	X	X	X	X	X	X
108-S05-062	Water	8/6/98	DUP**		X	X			X	X	X**	X	X	X	X	X	X	X
108-S05-061	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-060	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-063	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S05-064	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S06-004	Water	8/6/98	DUP**		X	X			X**	X	X	X	X	X	X	X	X	X
108-S07-033	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-035	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-034	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-038*	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-036	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-037	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S07-029*	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S07-030	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S07-031	Water	8/6/98	Duplicate of 108-S07-030		X	X												
108-S19-004	Water	8/6/98			X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S09-010	Water	8/6/98			X	X			X	X	X	X	X	X	X	X	X	X
108-S09-011	Water	8/6/98	Duplicate of 108-S09-010		X	X												
108-S00-034	Water	8/6/98	Trip blank		X													

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW22

					Analyses														
Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	VOC OLC02.1	SVOC	METALS	TPPH	TEPH	ALKALINITY	BROMIDE	CHLORIDE	FLUORIDE	NITRITE	NITRATE	SULFATE	O-PO4	SULFIDE	TDS
108-S00-035	Water	8/7/98	Trip blank		X														
108-S23-007	Water	8/7/98	MS/MSD/DUP**		X		X			X	X**	X	X**	X**	X**	X**	X	X	X
108-S22-013	Water	8/7/98			X		X	X	X	X	X	X	X	X	X	X	X	X	X
108-S12-004	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S13-013	Water	8/7/98		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S13-014	Water	8/7/98	MS/MSD/DUP**	Full	X**		X**	X**	X**	X	X	X	X	X	X	X	X	X**	X**
108-S13-015	Water	8/7/98			X		X	X	X	X	X	X	X	X	X	X	X	X	X
108-S13-016	Water	8/7/98	Duplicate of sample 108-S13-015		X		X	X	X										
108-S21-004	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S09-012	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S10-004	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S11-016	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S11-017	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X
108-S11-020	Water	8/7/98	Duplicate of sample 108-S11-019		X		X												
108-S11-019	Water	8/7/98	DUP**		X		X			X	X	X**	X	X	X	X	X	X	X
108-S11-018	Water	8/7/98			X		X			X	X	X	X	X	X	X	X	X	X

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW23

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses						
					VOC OLC02.1	SVOC	OP/PCB	METALS	TPPH	TEPH	
108-SBG-015	Water	8/10/98			X	X	X	X	X	X	
108-SBG-014	Water	8/10/98			X	X	X	X	X	X	
108-SBG-013	Water	8/10/98		Full	X	X	X	X	X	X	
108-SBG-016	Water	8/10/98			X	X	X	X	X	X	
108-S23-008	Water	8/10/98			X			X	X	X	
108-S07-032	Water	8/10/98			X			X	X	X	
108-S19-005	Water	8/10/98			X			X	X	X	
108-S99-007	Water	8/10/98	Field blank		X	X	X	X	X	X	
108-S99-008	Water	8/10/98	Equipment rinsate		X	X	X	X	X	X	
108-S00-036	Water	8/10/98	Trip blank		X						
108-S14-004	Water	8/11/98			X			X	X	X	
108-S19-006	Water	8/11/98			X			X	X	X	
108-S22-015	Water	8/11/98			X			X	X	X	
108-S22-014	Water	8/11/98			X			X	X	X	
108-IDW-003	Water	8/11/98		Full	X	X	X	X	X	X	
108-IDW-004	Water	8/11/98			X	X	X	X	X	X	
108-S00-037	Water	8/11/98	Trip blank		X						

TABLE 2
SAMPLE CROSS-REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW23

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses									
					ALKALINITY	BROMIDE	CHLORIDE	NITRITE	NITRATE	FLUORIDE	SULFATE	O-PO4	SULFIDE	TDS
108-SBG-015	Water	8/10/98			X	X	X	X	X	X	X	X	X	X
108-SBG-014	Water	8/10/98			X	X	X	X	X	X	X	X	X	X
108-SBG-013	Water	8/10/98		Full	X	X	X	X	X	X	X	X	X	X
108-SBG-016	Water	8/10/98			X	X	X	X	X	X	X	X	X	X
108-S23-008	Water	8/10/98			X	X	X	X	X	X	X	X	X	X
108-S07-032	Water	8/10/98	MS/MSD/DUP**		X**	X**	X**	X**	X**	X**	X**	X**	X**	X
108-S19-005	Water	8/10/98	MS/MSD/DUP		X	X	X	X	X	X	X	X	X	X
108-S99-007	Water	8/10/98	Field blank		X	X	X	X	X	X	X	X	X	X
108-S99-008	Water	8/10/98	Equipment rinsate		X	X	X	X	X	X	X	X	X	X
108-S00-036	Water	8/10/98	Trip blank											
108-S14-004	Water	8/11/98	MS/MSD/DUP**		X	X**	X**	X**	X**	X**	X**	X**	X	X
108-S19-006	Water	8/11/98			X	X	X	X	X	X	X	X	X	X
108-S22-015	Water	8/11/98			X	X	X	X	X	X	X	X	X	X
108-S22-014	Water	8/11/98			X	X	X	X	X	X	X	X	X	X
108-IDW-003	Water	8/11/98		Full	X	X	X	X	X	X	X	X	X	X
108-IDW-004	Water	8/11/98			X	X	X	X	X	X	X	X	X	X
108-S00-037	Water	8/11/98	Trip blank											

Notes:

*	= Cursory validation performed on all samples	***	= Full review performed on indicated parameters only
MS/MSD	= Matrix Spike/Matrix Spike Duplicate	**	= MS/MSD/DUP performed on indicated parameters only
DUP	= Matrix Duplicate	VOC	= Volatile Organic Compounds
SVOC	= Semivolatile Organic Compounds	OP/PCB	= Organochlorine Pesticides/Polychlorinated Biphenyls
TPPH	= Total Purgeable Petroleum Hydrocarbons	TEPH	= Total Extractable Petroleum Hydrocarbons
TOC	= Total Organic Carbon	O-PO4	= Orthophosphate as Phosphorus

TABLE 3

COMPLETENESS CRITERIA
NON-COMPLIANCE SAMPLES
POINT ALAMEDA
(Page 1 of 7)

SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S00-001, 108-S01-003, 108-S01-004, 108-S01-010, 108-S01-011, 108-S02-006, 108-S02-007, 108-S02-010, 108-S02-012	AAW01	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.
108-S01-005, 108-S01-015, 108-S02-001, 108-S02-002, 108-S02-004, 108-S02-005	AAW01	Acetone, 1,2-dibromo-3-chloropropane, and 2-butanone	Rejected due to calibration problems.
108-S02-019, 108-S02-020, 108-S02-022	AAW01	2-Butanone	Rejected due to calibration problems.
108-S01-003, 108-S01-004, 108-S01-005, 108-S01-011, 108-S01-015, 108-S02-001, 108-S02-002, 108-S02-004, 108-S02-005, 108-S02-006, 108-S02-007, 108-S02-010, 108-S02-012, 108-S02-019, 108-S02-020, 108-S02-022	AAW01		Rejected due to matrix spike recovery problems.
108-S00-002, 108-S00-003, 108-S01-001, 108-S01-002, 108-S01-012, 108-S02-015, 108-S03-002, 108-S03-003, 108-S04-001, 108-S05-001, 108-S05-002, 108-S05-003, 108-S05-004, 108-S05-008, 108-S05-009, 108-S05-010, 108-S05-012	AAW02	Acetone and 2-butanone	Rejected due to calibration problems.
108-S03-001	AAW02	Acetone and 1,2-dibromo-3-chloropropane	Rejected due to calibration problems.
108-S03-003	AAW02	1,2-Dibromo-3-chloropropane	Rejected due to calibration problems.
108-S04-002, 108-S04-003	AAW02	Acetone, 1,2-dibromo-3-chloropropane, and 2-butanone	Rejected due to calibration problems.
108-S00-004-, 108-S01-007, 108-S01-008, 108-S02-008, 108-S05-005, 108-S05-006, 108-S05-007, 108-S05-011, 108-S05-015, 108-S05-016, 108-S06-001, 108-S10-001	AAW03	Acetone and 2-butanone	Rejected due to calibration problems.
108-S02-008	AAW03	1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 2,2'-oxybis(1-chloropropane), 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2,4-dimethylphenol, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-chloronaphthalene, 2-chlorophenol, 2-methylnaphthalene, 2-methylphenol, 2-nitroaniline, 2-nitrophenol, 3,3'-dichlorobenzidine, 3-nitroaniline, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, 4-chloroaniline, 4-chlorophenyl-phenylether, 4-methylphenol, 4-nitrophenol, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-chloroethoxy)methane, bis(2-chloroethyl)ether, butylbenzylphthalate, carbazole, chrysene, di-n-butylphthalate, di-n-octylphthalate, dibenz(a,h)anthracene, diethylphthalate, dimethylphthalate, fluoranthene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, isophorone, n-nitroso-di-n-propylamine, n-nitrosodiphenylamine (1), naphthalene, nitrobenzene, pentachlorophenol, phenanthrene, phenol, pyrene	Rejected due to other problems, refer to data validation narrative.

TABLE 3

COMPLETENESS CRITERIA
NON-COMPLIANCE SAMPLES
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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S02-013	AAW03	1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 2,2'-oxybis(1-chloropropane), 2,4-nitrotoluene, 2,6-nitrotoluene, 2-chloronaphthalene, 2-nitroaniline, 3,3'-dichlorobenzidine, 3-nitroaniline, 4-bromophenyl-phenylether, 4-chloroaniline, 4-chlorophenyl-phenylether, 4-nitroaniline, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-chloroethoxy)methane, bis(2-chloroethyl(ether), butylbenzylphthalate, carbazole, chrysene, di-n-butylphthalate, di-n-octylphthalate, dibenz(a,h)anthracene, dibenzofuran, diethylphthalate, dimethylphthalate, fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, isophorone, n-nitroso-di-n-propylamine, n-nitrosodiphenylamine (1), nitrobenzene, phenanthrene, pyrene	Rejected due to surrogate spike recovery problems.
108-S11-001, 108-S11-002, 108-S11-003, 108-S11-004, 108-S11-005	AAW03	Acetone	Rejected due to calibration problems.
108-SBG-100, 108-S07-006	AAW04	Acetone	Rejected due to calibration problems.
108-SBG-100, 108-SBG-003	AAW04	2-Butanone	Rejected due to calibration problems.
108-S00-005, 108-S00-006, 108-S02-003, 108-S07-003, 108-S07-004, 108-S07-005, 108-S09-001, 108-S09-002, 108-S12-001, 108-S13-001, 108-S13-002, 108-S99-001, 108-S99-002, 108-SBG-001, 108-SBG-004	AAW04	Acetone and 2-butanone	Rejected due to calibration problems.
108-S00-007, 108-S01-013, 108-S02-017, 108-S02-018, 108-S04-005, 108-S13-003, 108-S13-004, 108-S14-001, 108-S22-001, 108-S22-002	AAW05	Acetone	Rejected due to calibration problems.
108-S00-008, 108-S02-014, 108-S02-021, 108-S04-006, 108-S04-008, 108-S04-009, 108-S19-001, 108-S23-002	AAW05	Acetone and 2-butanone	Rejected due to calibration problems.
108-S01-013	AAW05	Sulfate	Rejected due to matrix spike recovery problems.
108-S00-009, 108-S07-002, 108-S09-003, 108-S22-003	AAW06	Acetone	Rejected due to calibration problems.
108-S00-010, 108-S02-011, 108-S04-016, 108-S05-013, 108-S05-014, 108-S23-001	AAW06	2-Butanone	Rejected due to calibration problems.
108-S00-100, 108-S01-014, 108-S02-009, 108-S04-004, 108-S16-001, 108-S16-002, 108-S22-004	AAW06	Acetone and 2-butanone	Rejected due to calibration problems.

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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S00-011, 108-S00-012, 108-S01-016, 108-S01-017, 108-S01-018, 108-S01-019, 108-S01-020, 108-S01-022, 108-S01-023, 108-S01-027, 108-S01-028, 108-S04-010, 108-S04-011, 108-S04-012, 108-S05-017, 108-S07-017, 108-S09-004, 108-S22-005	AAW07	Acetone and 2-butanone	Rejected due to calibration problems.
108-S01-021, 108-S05-018	AAW07	2-Butanone	Rejected due to calibration problems.
108-S00-013, 108-S01-024, 108-S01-025, 108-S05-020, 108-S05-021, 108-S05-022, 108-S05-023, 108-S05-024, 108-S05-025, 108-S05-026, 108-S05-027, 108-S07-009, 108-S07-010, 108-S07-011, 108-S07-012, 108-S09-005, 108-S09-006, 108-S10-002	AAW08	Acetone and 2-butanone	Rejected due to calibration problems.
108-S05-019, 108-S07-008	AAW08	2-Butanone	Rejected due to calibration problems.
108-S00-014, 108-S03-006, 108-S04-016, 108-S04-017, 108-S04-018, 108-S04-019, 108-S05-028, 108-S05-029, 108-S05-030, 108-S05-031, 108-S05-032, 108-S06-002, 108-S11-006, 108-S11-008, 108-S11-009, 108-S11-010, 108-S16-003, 108-S16-004, 108-S23-004	AAW09	Acetone and 2-butanone	Rejected due to calibration problems.
108-S03-005	AAW09	2-Butanone	Rejected due to calibration problems.
108-S00-015, 108-S00-016, 108-S01-026, 108-S02-024, 108-S02-032, 108-S02-033, 108-S02-034, 108-S02-044, 108-S03-004, 108-S04-013, 108-S04-014, 108-S04-015, 108-S11-007, 108-S12-002, 108-S13-005, 108-S13-006, 108-S13-007, 108-S13-008, 108-SBG-008	AAW10	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.
108-S02-042	AAW10	2-Butanone and 2-hexanone	Rejected due to calibration problems.
108-S00-017, 108-S00-018, 108-S02-025, 108-S02-026, 108-S02-027, 108-S02-028, 108-S02-029, 108-S02-030, 108-S02-031, 108-S02-037, 108-S14-002, 108-S22-006, 108-S22-007, 108-S22-008, 108-S23-003, 108-S99-003, 108-S99-004, 108-SBG-005, 108-SBG-006, 108-SBG-007	AAW11	Acetone and 2-butanone	Rejected due to calibration problems.
108-IDW-001, 108-IDW-002, 108-S00-019, 108-S02-036, 108-S02-039, 108-S02-040, 108-S02-043, 108-S19-002	AAW12	Acetone and 2-butanone	Rejected due to calibration problems.

TABLE 3

COMPLETENESS CRITERIA
NON-COMPLIANCE SAMPLES
POINT ALAMEDA
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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S02-035	AAW12	4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, alpha-BHC, alpha-chlordane, aroclor-1016, aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, aroclor-1260, beta-BHC, delta-BHC, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, end sulfate, endrin, endrin aldehyde, andrin ketone, gamma-BHC (lindane), gamma-chlordane, heptachlor, heptachlor epoxide, methoxychlor, toxaphene	Rejected due to surrogate spike recovery problems.
108-S02-035, 108-S02-038, 108-S02-041	AAW12	2-Butanone	Rejected due to calibration problems.
108-S21-002	AAW12	2-Butanone	Rejected due to surrogate spike recovery problems and calibration problems.
108-S00-021, 108-S00-022, 108-S01-029, 108-S01-031, 108-S01-033, 108-S01-034, 108-S01-035, 108-S04-024, 108-S07-015, 108-S07-016, 108-S07-022, 108-S07-023	AAW13	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.
108-S01-029, 108-S01-031, 108-S01-033, 108-S01-034, 108-S01-035, 108-S04-022, 108-S04-023, 108-S04-024, 108-S04-025, 108-S04-046, 108-S07-015, 108-S07-016, 108-S07-017, 108-S07-018, 108-S07-023, 108-S99-005, 108-S99-006	AAW13	Selenium	Rejected due to matrix spike recovery problems.
108-S04-022, 108-S04-023, 108-S04-025, 108-S04-046, 108-S07-017, 108-S07-018, 108-S99-005, 108-S99-006	AAW13	Acetone and 2-butanone	Rejected due to calibration problems.
108-S07-022	AAW13	Selenium	Rejected due to matrix spike recovery problems and other problems; refer to data validation narrative.
108-S00-023, 108-S00-024, 108-S01-036, 108-S01-037, 108-S01-040, 108-S01-041, 108-S02-055, 108-S02-058, 108-S02-061, 108-S02-062, 108-S02-065, 108-S04-021, 108-S04-026, 108-S04-029, 108-S05-035, 108-S05-036, 108-S05-039, 108-S05-042, 108-S05-043, 108-S13-009	AAW14	Acetone and 2-butanone	Rejected due to calibration problems.
108-S01-036, 108-S01-037, 108-S01-040, 108-S01-041, 108-S02-055, 108-S02-058, 108-S02-061, 108-S02-062, 108-S02-065, 108-S04-021, 108-S04-026, 108-S04-029, 108-S05-035, 108-S05-036, 108-S05-039, 108-S05-042, 108-S05-043, 108-S13-009	AAW14	Selenium	Rejected due to matrix spike recovery problems.
108-S02-055	AAW14	Sulfate	Rejected due to matrix spike recovery problems.

TABLE 3

COMPLETENESS CRITERIA
NON-COMPLIANCE SAMPLES
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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S00-025, 108-S00-026, 108-S02-045, 108-S02-046, 108-S02-050, 108-S02-051, 108-S05-052, 108-S02-056, 108-S02-059, 108-S02-063, 108-S02-066, 108-S03-007, 108-S03-008, 108-S03-009, 108-S04-020, 108-S04-045, 108-S05-033, 108-S05-034, 108-S05-038, 108-S05-041	AAW15	Acetone and 2-butanone	Rejected due to calibration problems.
108-S00-027, 108-S02-053, 108-S02-060, 108-S05-047, 108-S05-048, 108-S06-003, 108-S07-013, 108-S07-014, 108-S07-020, 108-S09-009, 108-S10-003, 108-S11-011, 108-S11-012, 108-S11-013, 108-S11-014, 108-S11-015, 108-S12-003, 108-S13-010	AAW16	Acetone and 2-butanone	Rejected due to calibration problems.
108-S02-106, 108-S06-003, 108-S07-013, 108-S07-020, 108-S09-009, 108-S10-003, 108-S11-011, 108-S11-012, 108-S11-013, 108-S11-014, 108-S12-003, 108-S13-010	AAW16	Bromide	Rejected due to matrix spike recovery problems.
108-S00-028, 108-S04-043, 108-S04-044, 108-S05-040, 108-S05-044, 108-S05-045, 108-S05-046, 108-S07-019, 108-S07-021, 108-S09-007, 108-S09-008, 108-S13-011, 108-S13-012, 108-S14-003, 108-S19-003, 108-S21-003, 108-S22-011, 108-S22-012, 108-S23-005, 108-S23-006	AAW17	Acetone and 2-butanone	Rejected due to calibration problems.
108-S04-043, 108-S04-044, 108-S05-040, 108-S05-044, 108-S05-045, 108-S05-046, 108-S07-021, 108-S09-007, 108-S09-008, 108-S13-011, 108-S13-012, 108-S14-003, 108-S19-003, 108-S21-003, 108-S22-011, 108-S22-012, 108-S23-005, 108-S23-006	AAW17	Selenium	Rejected due to matrix spike recovery problems.
108-S07-019	AAW17	Selenium	Rejected due to matrix spike recovery problems and other problems; refer to data validation narrative.
108-S00-029, 108-S01-032, 108-S02-054, 108-S04-027, 108-S04-028, 108-S05-037, 108-S22-009, 108-SBG-009, 108-SBG-010, 108-SBG-011, 108-SBG-012	AAW18	Acetone and 2-butanone	Rejected due to calibration problems.
108-S02-057, 108-S02-064	AAW18	2-Butanone	Rejected due to calibration problems.
108-S01-032, 108-S02-054, 108-S02-057, 108-S02-064, 108-S04-027, 108-S04-028, 108-S05-037, 108-S22-009, 108-SBG-009, 108-SBG-010, 108-SBG-011, 108-SBG-012	AAW18	Selenium	Rejected due to matrix spike recovery problems.

TABLE 3

COMPLETENESS CRITERIA
NON-COMPLIANCE SAMPLES
POINT ALAMEDA
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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-S00-031, 108-S00-032, 108-S01-042, 108-S01-043, 108-S01-044, 108-S01-045, 108-S01-046, 108-S01-047, 108-S01-048, 108-S01-049, 108-S01-050, 108-S03-010, 108-S03-011, 108-S03-012, 108-S04-033, 108-S04-034, 108-S04-035, 108-S04-036, 108-S04-037	AAW19	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.
108-S01-051	AAW19	Acetone and 2-butanone	Rejected due to calibration problems and other problems; refer to data validation narrative.
108-S01-051	AAW19	1,1,1-Trichloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichlorobenzene, 1,2-dichloroethane, 1,2-dichloropropane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2-butanone, 2-hexanone, 4-methyl-2-pentanone, acetone, benzene, bromochloromethane, bromodichloromethane, bromoform, bromomethane, carbon disulfide, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, chloromethane, cis-1,2-dichloroethene, cis-1,3-dichloropropene, dibromochloromethane, ethylbenzene, methylene chloride, styrene, tetrachloroethene, toluene, trans-1,3-dichloropropene, xylene (total)	Rejected due to other problems; refer to data validation narrative.
108-S00-033, 108-S04-030, 108-S04-031, 108-S04-032, 108-S05-049, 109-S05-050, 108-S05-058	AAW20	Acetone, 2-butanone, and 4-methyl-2-pentanone	Rejected due to calibration problems.
108-S04-038, 108-S04-039, 108-S04-040, 108-S05-051, 108-S05-052, 108-S05-053, 108-S05-054, 108-S05-055, 108-S05-056, 108-S05-057	AAW20	Acetone and 2-butanone	Rejected due to calibration problems.
108-S00-034, 108-S07-029, 108-S07-030, 108-S07-031, 108-S07-033, 108-S07-035, 108-S07-036, 108-S07-037, 108-S09-010, 108-S09-011, 108-S19-004	AAW21	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.
108-S05-059, 108-S05-060, 108-S05-061, 108-S05-062, 108-S05-063, 108-S05-064, 108-S06-004, 108-S07-034	AAW21	Acetone and 2-butanone	Rejected due to calibration problems.
108-S07-033, 108-S07-034, 108-S07-036	AAW21	Diesel range organics and motor oil range organics	Rejected due to other problems; refer to data validation narrative.
108-S07-035	AAW21	Motor oil range organics	Rejected due to other problems; refer to data validation narrative.
108-S07-038	AAW21	2-Butanone and 2-hexanone	Rejected due to calibration problems.
108-S00-035, 108-S09-012, 108-S10-004, 108-S11-016, 108-S11-017, 108-S11-018, 108-S11-019, 108-S11-020, 108-S12-004, 108-S13-013, 108-S13-014, 108-S13-015, 108-S13-016, 108-S21-004, 108-S22-013, 108-S23-007	AAW22	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.

TABLE 3

COMPLETENESS CRITERIA
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POINT ALAMEDA
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SAMPLE NUMBERS	SDG NUMBER	PARAMETER	REASON FOR INCOMPLETENESS
108-IDW-003, 108-IDW-004, 108-S00-036, 108-S00-037, 108-S07-032, 108-S14-004, 108-S19-005, 108-S19-006, 108-S22-014, 108-S22-015, 108-S23-008, 108-S99-007, 108-S99-008, 108-SBG-013, 108-SBG-014, 108-SBG-015, 108-SBG-016	AAW23	Acetone, 2-butanone, and 2-hexanone	Rejected due to calibration problems.

TABLE 4

DATA VALIDATION QUALIFIERS AND COMMENT CODES
ALAMEDA POINT

Data Qualifiers[a]	Definition
U	Compound was analyzed, but was not detected above the concentration listed; the value listed is the sample quantitation limit.
J	Estimated concentration value; the result is considered qualitatively acceptable but quantitatively unreliable.
UJ	Estimated quantitation limit; the compound was analyzed, but was considered nondetected.
JN	An analyte has been tentatively identified; the associated numerical value represents its approximate concentration.
R	The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
No qualifier	The data are acceptable qualitatively and quantitatively.
Comment Codes	**Definition**
a	Surrogate spike recovery problems
b	Blank contamination problems
c	Matrix spike recovery problems
d	Duplicate (precision) problems
e	Internal standard problems
f	Calibration problems
g	Quantification below the reporting limit
h	Other problems, refer to data validation narrative
y	The typical fuel pattern was observed and the result indicates the presence of hydrocarbons
z	The standard fuel pattern does not match the detected constituents

Notes:

[a] "U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review." February 1994.
"U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review." February 1994.

TABLE 5

LABORATORY ANALYTICAL METHODS
ALAMEDA POINT

Parameter	Method	Reference
Volatile Organic Compounds	CLP SOW	CLP SOW 1994
Semivolatile Organic Compounds	CLP SOW	CLP SOW 1994
Organochlorine Pesticides and Polychlorinated Biphenyls	CLP SOW	CLP SOW 1994
Total Purgeable Petroleum Hydrocarbons	8015 Modified	EPA 1986
Total Extractable Petroleum Hydrocarbons	3510/8015 Modified	EPA 1986
Metals (Including Mercury)	CLP SOW	CLP SOW 1995
Alkalinity	310.1	EPA 1983
Common Anions	300.0	EPA 1983
Sulfide	376.1/376.2	EPA 1983
Nitrate/Nitrite-N	353.2	EPA 1983
Total Dissolved Solids	160.1	EPA 1983
Total Organic Carbon	9060	EPA 1986

Notes:

CLP SOW 1994	EPA Contract Laboratory Program Statement of Work for Organics Analysis
CLP SOW 1995	EPA Contract Laboratory Program Statement of Work for Inorganics Analysis
CVAA	Cold vapor atomic absorption spectroscopy
EPA 1983	Methods for Chemical Analysis of Water and Wastes, March
EPA 1986	Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition
SMEWW 1992	Standard Methods for the Examination of Water and Wastewater, 18th Edition (APHA)

ATTACHMENT A

LABORATORY PRECISION AND ACCURACY GOALS FROM NAVAL AIR STATION ALAMEDA QUALITY ASSURANCE PROJECT PLAN

TABLE 3-1

VOLATILE ORGANIC COMPOUNDS - CLP METHOD
MATRIX SPIKE AND SURROGATE SPIKE RECOVERY LIMITS
NAVAL AIR STATION, ALAMEDA

Matrix Spike Compound	Water	
	% Recovery	RPD
1,1-Dichloroethene	61-145	14
Trichloroethene	71-120	14
Chlorobenzene	75-130	13
Toluene	76-125	13
Benzene	76-127	11

Surrogate Spike Compound	Water
	% Recovery
Toluene-d8	88-110
Bromofluorobenzene	86-115
1,2-Dichloroethane-d4	76-114

Notes:

CLP Contract Laboratory Program
RPD Relative Percent Difference

TABLE 3-2

SEMIVOLATILE ORGANIC COMPOUNDS - CLP METHOD MATRIX SPIKE AND SURROGATE SPIKE RECOVERY LIMITS NAVAL AIR STATION, ALAMEDA

Analyte	Water	
	% R	RPD
1,2,4-Trichlorobenzene	39-98	28
Acenaphthene	46-118	31
2,4-Dinitrotoluene	24-96	38
Pyrene	26-127	31
N-Nitroso-di-n-propylamine	41-116	38
1,4-Dichlorobenzene	36-97	28
Pentachlorophenol	9-103	50
Phenol	12-110	42
2-Chlorophenol	27-123	40
4-Chloro-3-methylphenol	23-97	42
4-Nitrophenol	10-80	50

Surrogate Spike Compound	Water
	% Recovery
Nitrobenzene-d5	35-114
2-Fluorbiphenyl	43-116
Terphenyl-d14	33-141
Phenol-d5	10-110
2-Fluorophenol	21-110
2,4,6-Tribromophenol	10-123
2-Chlorophenol-d4	33-110a
1,2-Dichlorobenzene-d4	16-110a

Notes:

CLP Contract Laboratory Program
%R Percent recovery
RPD Relative percent difference
a These limits are advisory only

TABLE 3-3

ORGANOCHLORINE PESTICIDES/ POLYCHLORINATED BIPHENYLS - CLP METHOD MATRIX SPIKE AND SURROGATE SPIKE RECOVERY LIMITS NAVAL AIR STATION, ALAMEDA

Matrix Spike Analyte	Water	
	% Recovery	RPD
Gamma-BHC (Lindane)	56-123	15
Heptachlor	40-131	20
Aldrin	40-120	22
Dieldrin	52-126	18
Endrin	56-121	21
4-4'-DDT	38-127	27

Surrogate Spike Compound	Water
	% Recovery
Tetrachloro-m-xylene	60-150
Decachlorobiphenyl	60-150

Notes:

BHC Benzene Hexachloride
CLP Contract Laboratory Program
DDT Dichlorodiphenyltrichloroethane
RPD Relative Percent Difference

TABLE 3-4

CLP INORGANICS AND OTHER MISCELLANEOUS ANALYTES MATRIX SPIKE AND SURROGATE SPIKE ACCURACY AND PRECISION LIMITS NAVAL AIR STATION, ALAMEDA

Matrix Spike Analyte	Water	
	% Recovery	RPD
Metals	75-125	25
Total Dissolved Solids	75-125	25
Nitrate/Nitrite-N	75-125	25
Common Anions	75-125	25
Sulfide	75-125	25
Alkalinity	75-125	25
Total Organic Carbon	75-125	25
Total Extractable Petroleum Hydrocarbons (TEPH)	40-140	50
Total Purgable Petroleum Hydrocarbons (TPPH)	60-140	50

Surrogate Spike Compound	Water
	% Recovery
Surrogate Spike Compound (TPPH)	75-125
Surrogate Spike Compound (TEPH)	60-140

Notes:

CLP Contract Laboratory Program
RPD Relative Percent Difference
TPPH Total Purgable Petroleum Hydrocarbons
TEPH Total Extractable Petroleum Hydrocarbons

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 1 of 8)

Volatile Organic Compounds by CLP SOW Contract Required Quantitation Limits	
Analyte	Water (µg/L)
Chloromethane	2
Bromomethane	2
Vinyl chloride	0.5
Chloroethane	2
Methylene chloride	2
Acetone	2
Carbon disulfide	2
1,1-Dichloroethene	2
1,1-Dichloroethane	2
1,2-Dichloroethene	2
Chloroform	2
1,2-Dichloroethane	0.5
2-Butanone	2
1,1,1-Trichloroethane	2
Carbon tetrachloride	0.5
Bromodichloromethane	2
1,2-Dichloropropane	2
cis-1,3-Dichloropropene	2
Trichloroethene	2
Dibromochloromethane	2
1,1,2-Trichloroethane	2
Benzene	1
trans-1,3-Dichloropropene	0.5
Bromoform	2
4-Methyl-2-pentanone	2
2-Hexanone	2
Tetrachloroethene	2
Toluene	2
1,1,2,2-Tetrachloroethane	2
Chlorobenzene	2
Ethylbenzene	2
Styrene	2
Total Xylenes	2

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALEMEDA
(Page 2 of 8)

Semivolatile Organic Coumpounds by CLP SOW Contract Required Quantitation Limits	
Analyte	Water (µg/L)
Phenol	10
Bis(2-Chlorethyl)ether	10
2-Chlorophenol	10
1,3-Dichlorobenzene	5
1,4-Dichlorobenzene (µg/L)	5
1,2-Dichlorobenzene (µg/L)	5
2-Methylphenol	10
2,2-Oxybis(1-Chloropropane)	10
4-Methylphenol	10
N-Nitroso-di-n-propylamine	10
Hexachloroethane	10
Nitrobenzene	10
Isophorone	10
2-Nitrophenol	10
2,4-Dimethylphenol	10
Bis(2-Chloroethoxy)methane	10
2,4-Dichlorophenol	10
1,2,4-Trichlorobenzene	10
Naphthalene	10
4-Chloroaniline	10
Hexachlorobutadiene	10
2-Methylnaphthalene	10
Hexachlorocyclopentadiene	10
2,4,6-Trichlorophenol	10
2,4,5-Trichlorophenol	25
2-Chloronaphthalene	10
2-Nitroaniline	25
Dimethylphthalate	10
Acenaphthylene	10
2,6-Dinitrotoluene	10
3-Nitroaniline	25
Acenaphthene	10
2,4-Dinitrophenol	25

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 3 of 8)

Semivolatile Organic Compounds by CLP SOW Contract Required Quantitation Limits	
Analyte	Water (µg/L)
4-Nitrophenol	25
Dibenzofuran	10
2,4-Dinitrotoluene	10
Diethylphthalate	10
4-Chlorophenyl-phenylether	10
Fluorene	10
4-Nitroaniline	25
4,6-Dinitro-2-methylphenol	25
N-nitrosodiphenylamine	10
4-Bromophenyl-phenylether	10
Hexachlorobenzene	10
Pentachlorophenol	25
Phenanthrene	10
Anthracene	10
Carbazole	10
Di-n-butylphthalate	10
Fluoranthene	10
Pyrene	10
Butylbenzylphthalate	10
3,3-Dichlorobenzidine	10
Benzo(a)anthracene	10
Chrysene	10
Bis(2-ethylhexyl)phthalate	4
Di-n-octylphthalate	10
Benzo(b)fluoranthene	10
Benzo(k)fluoranthene	10
Benzo(a)pyrene	10
Indeno(1,2,3-cd)pyrene	10
Dibenz(a,h)anthracene	10
Benzo(g,h,i)perylene	10

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 4 of 8)

Total Petroleum Hydrocarbons by CLP SOW Contract Required Quantitation Limits		
Analyte	**Water (mg/L)**	**EPA Method**
Total purgable petroleum hydrocarbons reported as:		
Gasoline	0.05	Modified 8015
Total extractable petroleum hydrocarbons reported as:		
Diesel	0.1	Modified 8015
Kerosene	0.1	Modified 8015
Motor Oil	0.1	Modified 8015
JP-5	0.1	Modified 8015

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 5 of 8)

Organochlorine Pesticides and PCBs by CLP SOW Contract Required Quantitation Limits	
Analyte	Water (µg/L)
α-BHC	0.05
β-BHC	0.05
δ-BHC	0.05
γ-BHC (Lindane)	0.05
Heptachlor	0.05
Aldrin	0.05
Heptachlor epoxide	0.05
Endosulfan I	0.05
Dieldrin	0.10
4,4'-DDE	0.10
Endrin	0.10
Endosulfan II	0.10
4,4'-DDD	0.10
Endosulfan sulfate	0.10
4,4'-DDT	0.10
Methoxychlor	0.50
Endrin ketone	0.10
Endrin Aldehyde	0.10
α-Chlordane	0.05
γ-Chlordane	0.05
Toxaphene	5.0
Aroclor 1016	1.0
Aroclor 1221	2.0
Aroclor 1232	1.0
Aroclor 1242	1.0
Aroclor 1248	1.0
Aroclor 1254	1.0
Aroclor 1260	1.0

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 6 of 8)

Metals by CLP SOW Contract Required Detection Limits	
Analyte	**Water (µg/L)**
Aluminum	50b
Antimony	6b
Arsenic	10
Barium	200
Beryllium	4b
Cadmium	5
Calcium	5,000
Chromium	10
Cobalt	50
Copper	4.9b
Iron	100
Lead	3
Magnesium	5,000
Manganese	15
Mercury	0.2
Molybdenum	10
Nickel	8.3b
Potassium	5,000
Selenium	5
Silver	2.3b
Sodium	5,000
Thallium	2b
Vanadium	50
Zinc	20

TABLE 3-5

CONTRACT REQUIRED REPORTING LIMITS
NAVAL AIR STATION, ALAMEDA
(Page 7 of 8)

Non-CLP Methods Contract Required Detection Limits	
Analyte	**Water (mg/L)**
Alkalinity	5.0
Nitrate as Nitrogen	0.05
Nitrite as Nitrogen	0.05
Total Dissolved Solids (TDS)	10.0
Chloride	0.50
Sulfate	0.50
Fluoride	0.50
Ortho-phosphate-p	0.05
Total Organic Carbon (TOC)	1.0

Notes:

µg/L	micrograms per liter
BHC	Benzene hexachloride
CLP	Contract Laboratory Program
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
mg/L	Milligrams per liter
SOW	Statement of Work
TDS	Total Dissolved Solids
TOC	Total Organic Carbon

ATTACHMENT A
TABLE 3-5 - CONTRACT REQUIRED REPORTING LIMITS
PAGE 8 OF 8

QUALITY CONTROL SUMMARY REPORT FOR QUARTERLY GROUNDWATER MONITORING NOVEMBER 1997 – AUGUST 1998

THE ABOVE IDENTIFIED PAGE IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY NAVFAC SOUTHWEST TO LOCATE THIS PAGE. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

APPENDIX A

DATA VALIDATION NARRATIVES

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW01

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: March 25, 1998

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Pesticide/PCBs, CLP Metals, and Non-CLP Inorganic and Physical Analysis

CLP Volatiles

1. Holding times: Only the target compound chlorobenzene not the full target compound list (TCL) was qualified in samples 108-S02-010DL* and 108-S02-022DL.

2. Blank contamination: No field blanks were included in this SDG. The trip blank, sample 108-S00-001 was free of target compounds.

3. Calibration: The RRF listed was for the initial calibration, not the continuing calibration.

CLP Semivolatiles

1. Surrogate recovery: Terphenyl-d14 recoveries were outside QC limits in 11 samples. No data qualifications were required because only one base/neutral surrogate was outside QC limits in each sample.

2. Laboratory Control Sample: The QC limit for 4-Nitrophenol should not be listed as the sample was within limits

3. Blank Contamination: No Semivolatilecontamination was found in the method blanks,

4. Continuing calibration: Non-detected results for hexachlorocyclopentadiene and 4-nitrophenol in sample 108-S02-022 (in addition to the listed samples) were qualified as estimated.

5. Field duplicate: Other than the common laboratory contaminant bis(2-ethylhexyl)phthalate, field duplicate samples 108-S02-004 and 108-S02-005 were free of target analytes.

6. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in the full validation samples.

7. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The samples were found to be correctly quantitated.

CLP Pesticide/PCB

1. Pesticide cleanup checks: Florisil checks were performed and all recoveries were within specified QC limits.

2. TCL identification: No pesticide/PCB compounds were detected in the full validation samples.

3. Compound quantitation: No pesticide/PCB compounds were detected in the full validation samples. The reported detection limits were consistent with Tetra Tech EMI's required reporting limits and reflect any dilutions and volumes.

CLP Metals

1. Blank contamination: The target analyte molybdenum was also qualified in sample 108-S01-010 based on continuing calibration blank (CCB) contamination.

Non-CLP Inorganic and Physical Analysis

1. Analyte quantitation and reported detection limits. The laboratory reported detection limit for sulfide was 1.0 mg/L not 0.45 mg/L as listed in the data validation report.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2536A
Review Date:	December 17 through December 18, 1997
Sample Delivery Group (SDG) No.:	AAW01

Sample Nos.:

108-S02-006	108-S01-010	108-S02-020*	108-S02-012DUP
108-S02-010*	108-S01-010DL	108-S02-020DL*	108-S01-011MS
108-S02-010DL*	108-S01-003	108-S02-022	108-S01-011MSD
108-S02-012	108-S01-005	108-S02-022DL	108-S01-010MS
108-S02-007	108-S01-015	108-S02-019	108-S01-010MSD
108-S01-004	108-S02-001	108-S02-006MS	108-S01-003MS
108-S00-001	108-S02-002	108-S02-006DUP	108-S01-003DUP
108-S00-001RE	108-S02-004	108-S02-012MS	108-S02-019MS
108-S01-011	108-S02-005		108-S02-019DUP

* Full Validation Sample

Matrix:	Water
Collection Date(s):	October 29 through October 30, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

*	Holding times
	GC/MS instrument performance check
*	Initial and continuing calibrations
*	Blanks
*	Surrogate recovery
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Internal standard performance
	Target compound identification
	Tentatively identified compounds
	Compound quantitation
	Reported detection limits
	System performance
*	Overall assessment of data for the SDG

CLP Inorganic Parameters

*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
	ICP interference check sample
	GFAA quality control
*	ICP serial dilution
	Sample result verification
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

*	Method compliance
*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
*	Surrogate recovery
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

LE 1

CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 7-8	pg. 8	N/A	pg. 8	pg. 8	pg. 9-10	√	√	pg. 11
SVOA	√	√	pg. 12	N/A	pg. 12-13	pg. 13	pg. 13-14	√	pg. 14	pg. 14-15
Pesticide/PCB	√	√	pg. 16	N/A	pg. 16	√	pg. 16-17	N/A	N/A	√
Metals	√	N/A	pg. 19-20	√	√	pg. 18-19	√	N/A	pg. 21	pg. 21-22
Alkalinity	√	N/A	pg. 23-24	pg. 24	√	√	√	N/A	N/A	√
Sulfide	√	N/A	√	√	√	√	√	N/A	N/A	√
TDS	√	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	pg. 24	√	√	√	√	N/A	N/A	√
Chloride	√	N/A	√	√	√	√	√	N/A	N/A	√
Fluoride	√	N/A	√	√	√	√	pg. 23	N/A	N/A	√
Sulfate	√	N/A	√	√	√	√	√	N/A	N/A	√
Phosphate	√	N/A	pg. 24	√	√	√	pg. 23	N/A	N/A	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-S02-010*, 108-S02-010DL, 108-S02-020*, and 108-S02-020DL*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 11	√	N/A	N/A
SVOA	√	√	pg. 14-15	√	pg. 15	√	N/A	N/A
Pesticide/PCB	N/A	√	√	√	N/A	√	N/A	N/A
Metals	N/A	√	√	√	N/A	N/A	√	pg. 22
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 25	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

- All volatile compounds in samples 108-S02-010DL* 108-S02-020* 108-S02-022DL 108-S00-001RE 108-S02-022 108-S02-019

The analysis holding time of 14 days for preserved waters was exceeded by one day in samples 108-S02-010DL* 108-S00-001RE

The analysis holding time of 7 days for unpreserved waters was exceeded by 7 days in samples 108-S02-020* 108-S02-022 108-S02-022DL 108-S02-019

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

- All volatile compounds in sample 108-S00-001

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S00-001	1,2-Dichloroethane-d4	79	80-120
108-S00-001	Bromofluorobenzene	77	80-120

Low recoveries indicate that detected and nondetected results may be biased low.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in sample 108-S02-010*

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S02-010*	Toluene-d8	162	80-120

High percent recoveries indicate that detected results may be biased high.

C. The other surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S00-001	Toluene-d8	126	80-120

Although the above listed percent recovery demonstrates a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except in two samples, were acceptable and therefore no data required qualification. The Toluene-d8 surrogate recovery in sample 108-S02-010* demonstrated a high bias and the associated sample detected results were qualified as estimated based on the surrogate recoveries. The 1,2-Dichloroethane-d4 and Bromofluorobenzene surrogate recoveries in sample 108-S00-001 demonstrated a low bias and the associated sample results were qualified as estimated based on the surrogate recoveries.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the following exception:

LCS ID	Compound	RPD	QC Limits
VBLKSYBS/BSD	Bromomethane	53	≤40

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Acetone in samples 108-S02-020* 108-S02-022 108-S02-019

Acetone and Methylene chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks and field blanks.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

• 1,2,4-Trichlorobenzene in samples	108-S02-006	108-S02-007	108-S01-011
	108-S02-010*	108-S01-004	108-S01-010
	108-S02-012	108-S00-001	108-S01-003

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
7/28/97	1,2,4-Trichlorobenzene	35.3

B. Due to initial calibration problems, the following detected results are qualified as estimated and nondetected results are rejected (Jf/Rf).

• Acetone, 2-Butanone, and 2-Hexanone in samples	108-S02-006	108-S02-007	108-S01-011
	108-S02-010*	108-S01-004	108-S01-010
	108-S02-012	108-S00-001	108-S01-003
• Acetone and 2-Butanone in samples	108-S02-010DL*	108-S02-001	108-S02-020*
	108-S00-001RE	108-S02-002	108-S02-022
	108-S01-005	108-S02-004	108-S02-022DL
	108-S01-015	108-S02-005	108-S02-019

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
7/28/97	Acetone	0.012
7/28/97	2-Butanone	0.018
7/28/97	2-Hexanone	0.049
11/12/97	Acetone	0.026
11/12/97	2-Butanone	0.044

C. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Vinyl chloride and Chloromethane in samples	108-S02-006	108-S02-007	108-S01-011
	108-S02-010*	108-S01-004	108-S01-010
	108-S02-012	108-S00-001	108-S01-003
• Bromomethane in samples	108-S01-005	108-S02-001	108-S02-004
	108-S01-015	108-S02-002	108-S02-005

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% with the following exceptions:

Calibration Date	Compound	%D
11/12/97 (BBB12)	Vinyl chloride	32.2
11/12/97 (BBB12)	Chloromethane	40.0
11/12/97 (VCB12)	Bromomethane	36.1

D. Due to continuing calibration problems, the following detected results were qualified as estimated and the nondetected results are as rejected (Jf/Rf).

• Acetone, 2-Butanone, and 2-Hexanone in samples	108-S02-006 108-S02-010* 108-S02-012	108-S02-007 108-S01-004 108-S00-001	108-S01-011 108-S01-010 108-S01-003
• Acetone, 2-Butanone, and 1,2-Dibromo-3-chloropropane in samples	108-S01-005 108-S01-015	108-S02-001 108-S02-002	108-S02-004 108-S02-005
• Acetone in samples	108-S02-010DL* 108-S00-001RE	108-S02-020* 108-S02-022	108-S02-022DL 108-S02-019

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
11/12/97 (BBB12)	Acetone	0.009
11/12/97 (BBB12)	2-Butanone	0.016
11/12/97 (BBB12)	2-Hexanone	0.038
11/12/97 (VCB12)	Acetone	0.023
11/12/97 (VCB12)	2-Butanone	0.043
11/12/97 (VCB12)	1,2-Dibromo-3-chloropropane	0.049
11/13/97	Acetone	0.032

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. There were no detected results in the field duplicate pair 108-S02-004 and 108-S02-005.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

- Chlorobenzene in samples 108-S02-010*
  108-S02-022

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Sample 108-S02-010*, 108-S02-010DL*, and 108-S02-020*

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles.

II. Surrogate Recovery

A. Surrogate recoveries were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Pentachlorophenol, Acenaphthene, 4-Nitrophenol, and Pyrene were acceptable and therefore no data required qualification. The Acenaphthene LCS percent recoveries demonstrated a low bias and the associated sample results were qualified as estimated. Since 4-Nitrophenol, Pentachlorophenol, and Pyrene LCS precision and recovery demonstrated a high bias and the associated sample results were nondetected, data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Acenaphthene in samples	108-S02-010*	108-S01-010DL	108-S02-020*
	108-S02-012	108-S01-015	108-S02-020DL*
	108-S02-007	108-S02-004	108-S02-022
	108-S01-011	108-S02-005	108-S02-019
	108-S01-010		

The result obtained in the analysis of the LCS was not within the control limits as shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKBDBS/D	Acenaphthene	-	42	46-118	69	≤31

Detected results may be biased low and false nondetects may have been reported.

C. The other results obtained in the analysis of the LCS not within the control limits are shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKBDBS/D	Pentachlorophenol	110	117	9-103	-	≤31
SBLKBDBS/D	4-Nitrophenol	-	82	10-80	-	≤31
SBLKBDBS/D	Pyrene	-	-	-	69	≤31

Although the above listed recoveries demonstrate a high bias, the associated samples results were nondetected and therefore were not qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

• Bis(2-ethylhexyl)phthalate in samples	108-S02-010*	108-S01-010	108-S02-005
	108-S02-012	108-S01-015	108-S02-020*
	108-S02-007	108-S02-004	108-S02-022
	108-S01-011		

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

• 3-Nitroaniline and 2,4-Dinitrophenol in samples	108-S02-010*	108-S01-010DL	108-S02-020*
	108-S02-012	108-S01-015	108-S02-020DL*
	108-S02-007	108-S02-004	108-S02-022
	108-S01-011	108-S02-005	108-S02-019
	108-S01-010		

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/7/97	3-Nitroaniline	34.8
11/7/97	2,4-Dinitrophenol	30.5

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Hexachlorocyclopentadiene and 4-Nitrophenol in samples	108-S02-010* 108-S02-012 108-S02-007 108-S01-011 108-S01-010	108-S01-015 108-S02-004 108-S02-005 108-S02-020*
• 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, and Benzo(b)fluoranthene in samples	108-S01-010DL 108-S02-020DL*	108-S02-019

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/11/97	Hexachlorocyclopentadiene	30.2
11/11/97	4-Nitrophenol	29.4
11/18/97	2,2'-Oxybis(1-chloropropane)	57.0
11/18/97	3-Nitroaniline	44.7
11/18/97	Benzo(b)fluoranthene	25.2

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S02-004 and 108-S02-005:

- 143% for Bis(2-ethylhexyl)phthalate

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

Detected results reported below the CRQL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

B. The following detected results are qualified as estimated (Jh).

- Naphthalene in samples 108-S01-010 108-S02-020*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108S02-010*, 108-S02-020*, and 108-S02-020DL*

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in samples 108S02-010*, 108-S02-020*, and 108-S02-020DL*.

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in samples 108S02-010*, 108-S02-020*, and 108-S02-020DL*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP PESTICIDE/PCB ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for pesticide/PCBs.

II. Surrogate Recovery

A. Surrogate recoveries were within the 30-150% CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples.

B. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the following exceptions:

LCS ID	Compound	% R	QC Limits
PBLKIVLCS	Aldrin	122	40-120

Although the above listed recovery demonstrates a high bias, the associated sample results were nondetected and therefore were not qualified.

V. Blank Contamination

A. No pesticide or PCB contaminants were found in the method blanks.

VI. Calibrations

A. A Resolution check mixture was analyzed at the beginning of the initial calibration sequence on each GC column. The resolution between adjacent peaks of target compounds was greater than or equal to 60% as required in the CLP SOW.

B. Performance evaluation mixtures (PEM) were analyzed at the proper frequency. The resolution between adjacent peaks was 90% on both GC columns. The absolute retention times for the initial and continuing PEMs were within the calculated retention time windows based on the three-point initial calibration.

C. The individual 4,4'-DDT and Endrin breakdowns were less than or equal to 20.0% and the combined breakdowns were less than or equal to 30.0% as required in the CLP SOW.

D. The relative percent differences (RPD) of amounts of each compound in PEMs were within the 25.0% CLP limits.

E. The initial calibration sequence was followed as required in the CLP SOW. Initial calibration of single and multicomponent compounds was performed for both columns at proper frequencies. The retention time windows were established according to the CLP SOW.

F. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- Heptachlor and 4,4'-DDE in samples 108-S02-010 108-S02-020

The percent relative standard deviations (%RSD) of calibration factors for single component compounds were within the 20.0% CLP limits with the following exceptions:

Calibration Date	Compound	%RSD
11/11/97	Heptachlor	24.13
11/11/97	4,4'-DDE	21.22

The retention time windows were established according to the CLP SOW.

All required peaks for multicomponent compounds were present.

G. Continuing calibration sequence was followed as required in the CLP SOW. No more than 12 hours elapsed between continuing calibration analyses in an analytical sequence . The retention times (RT) of all compounds in Individual Mix and multicomponent standards were within CLP limits. The relative percent differences (RPD) of amount in Individual Mix standards were within the 25.0% CLP limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG for CLP pesticide/PCB analysis.

VIII. Other Qualifications

A. No other qualifications were required.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S02-006	108-S01-011	108-S01-015	108-S02-005
	108-S02-010*	108-S01-010	108-S02-001	108-S02-020*
	108-S02-012	108-S01-003	108-S02-002	108-S02-022
	108-S02-007	108-S01-005	108-S02-004	108-S02-019
	108-S01-004			
• Antimony in samples	108-S02-006	108-S01-004	108-S01-005	108-S02-020*
	108-S02-010*	108-S01-011	108-S01-015	108-S02-022
	108-S02-012	108-S01-010	108-S02-005	108-S02-019
• Arsenic in samples	108-S02-010*	108-S01-010	108-S02-001	108-S02-005
	108-S02-012	108-S01-003	108-S02-002	108-S02-020*
	108-S01-004	108-S01-005	108-S02-004	108-S02-022
	108-S01-011	108-S01-015		
• Iron in samples	108-S01-004	108-S01-010	108-S01-015	
• Lead in samples	108-S01-010			
• Manganese in samples	108-S01-011	108-S02-002		

• Nickel in samples	108-S02-006	108-S01-004	108-S01-005	108-S02-002
	108-S02-010*	108-S01-011	108-S01-015	108-S02-004
	108-S02-012	108-S01-010	108-S02-001	108-S02-005
	108-S02-007	108-S01-003		
• Selenium in samples	108-S01-005	108-S02-004	108-S02-005	
• Vanadium in samples	108-S02-010*	108-S01-005	108-S02-002	108-S02-022
	108-S02-012	108-S02-001	108-S02-020*	108-S02-019
	108-S01-010			
• Molybdenum in samples	108-S02-006	108-S01-011	108-S01-005	108-S02-002
	108-S02-007	108-S01-003	108-S01-015	108-S02-022
	108-S01-004			

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	PB	22.82
Aluminum	CCB	79.1
Antimony	PB	0.84
Antimony	CCB	3.1
Arsenic	CCB	2.5
Calcium	PB	19.85
Calcium	CCB	52.6
Iron	PB	9.65
Iron	CCB	21.2
Lead	CCB	2.4
Magnesium	PB	6.92
Magnesium	CCB	37.8
Manganese	CCB	1.3
Nickel	PB	0.60
Nickel	CCB	1.6
Potassium	PB	69.12
Potassium	CCB	129.8
Selenium	CCB	2.1
Vanadium	CCB	1.5
Molybdenum	CCB	0.8

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Due to a severe problem in the MS analysis, the following detected results are estimated and the nondetected results are rejected (Jc/Rc).

• Lead in samples	108-S02-006	108-S01-011	108-S01-015	108-S02-005
	108-S02-010*	108-S01-010	108-S02-001	108-S02-020*
	108-S02-012	108-S01-003	108-S02-002	108-S02-022
	108-S02-007	108-S01-005	108-S02-004	108-S02-019
	108-S01-004			

The recoveries that did not meet the CLP limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S02-006MS	Lead	0.0	75-125

Spike recoveries below 30% indicate that detects may be biased low and false nondetects may have been reported.

B. Due to accuracy problems in the MS analysis, the following detected and nondetected results are qualified as estimated (Jc/UJc).

• Nickel and Selenium in samples	108-S02-006	108-S01-011	108-S01-015	108-S02-005
	108-S02-010*	108-S01-010	108-S02-001	108-S02-020*
	108-S02-012	108-S01-003	108-S02-002	108-S02-022
	108-S02-007	108-S01-005	108-S02-004	108-S02-019
	108-S01-004			

The recoveries that did not meet the CLP limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S02-006MS	Nickel	74.6	75-125
108-S02-006MS	Selenium	56.0	75-125

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

C. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

• Silver in samples	108-S02-004	108-S02-005

The recoveries that did not meet the CLP limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S02-006MS	Silver	131.4	75-125

Spike recoveries above 125% indicate that detected results may be biased high.
All other associated sample results were nondetected and therefore were not qualified.

D. A post-digest spike sample was not performed for Nickel. Although this is a protocol violation, the Nickel result was nominally outside recovery limits therefore data qualification was not warranted.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤10.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. Due to ICP serial dilution problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Calcium, Iron, Manganese, Potassium, and Sodium in samples	108-S02-006	108-S01-011	108-S01-015	108-S02-005
	108-S02-010*	108-S01-010	108-S02-001	108-S02-020*
	108-S02-012	108-S01-003	108-S02-002	108-S02-022
	108-S02-007	108-S01-005	108-S02-004	108-S02-019
	108-S01-004			

The percent difference between the original sample result and the serial dilution result was outside the QC limits of 10% for analyte concentrations greater than 50x the IDL as shown below.

Sample ID	Analyte	Original Concentration	50x IDL	%D
108-S02-006	Calcium	413222	375.0	15.5
108-S02-006	Iron	47891.0	565.0	14.6
108-S02-006	Manganese	8617.35	20.0	14.7
108-S02-006	Potassium	169909.9	1190.0	19.4
108-S02-006	Sodium	156789.2	9500	22.1

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S02-004 and 108-S02-005:

- 200% for Antimony
- 119% for Cadmium
- 33% for Silver
- 100% for Zinc

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-S02-010* and 108-S02-020*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Due to analytical spike percent recovery problems, the following nondetected results are qualified as estimated (UJh).

- Thallium in sample 108-S02-010*

The analytical spike recovery results did not meet the 85-115% recovery criteria for accuracy. The percent recovery for each analyte is presented below.

Sample	Analyte	%Recovery
108-S02-010*	Thallium	66.3

The analytical spike recovery results in the samples listed above show an analytical deficiency. Low analytical spike results indicate a low bias in detected results or possible false nondetects in nondetected results.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL .

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total Dissolved Solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, and Nitrite.

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, and Fluoride, 14 day analysis holding time requirements for Alkalinity, 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method.

B. All Initial and Continuing calibration verification frequency percent recoveries (%R) were within the 90-110% QC limits with the following exception listed below.

Due to calibration problems, the following nondetected results are qualified as estimated (UJf).

- Phosphate in samples 108-S02-006 108-S02-010* 108-S02-012

The ICV for Phosphate percent recovery was 88.1%, less than the control limits of 90-110%. The other samples for Phosphate and Fluoride were preceded by CCVs within criteria and were not qualified.

C. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the exception of Alkalinity (Bicarbonate & Carbonate). Although this is a protocol violation the associated LCS recoveries were acceptable and therefore the data did not require qualification.

B. Due to a severe problem in the MS analysis, the following detected results are estimated (Jc).

- Alkalinity (Bicarbonate) in samples 108-S02-022 108-S02-019

Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

Sample ID	Analyte	%R	QC Limits
9710G795-004MS	Alkalinity (Bicarbonate)	0.0	75-125

Spike recoveries below 30% indicate that detects may be biased low and false nondetects may have been reported.

C. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

- Bromide in samples 108-S02-001 108-S02-002 108-S02-004 108-S02-019
- Phosphate in sample 108-S02-002

Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

Sample ID	Analyte	MS %R	MSD %R	QC Limits
9710G795-003	Bromide	165.7	134.7	75-125
9710G795-003	Phosphate	137.8	-	75-125

Spike recoveries above 125% indicate that detected results may be biased high. All other associated sample results were nondetected and therefore were not qualified.

V. Matrix Duplicate

A. Matrix duplicate (DUP) analyses were reviewed for each matrix as applicable with the exception of Alkalinity (Bicarbonate & Carbonate). Although this is a protocol violation the associated LCS precision was acceptable and therefore the data did not require qualification.

All other relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses following exceptions:

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits and the relative percent differences (RPD) were within the laboratory established QC limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S02-010* and 108-S02-020*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were <u>not</u> consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 0.45 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP volatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except in two samples, were acceptable and therefore no data required qualification. The Toluene-d8 surrogate recovery in sample 108-S02-010* demonstrated a high bias and the associated sample results were qualified as estimated based on the surrogate recoveries. The 1,2-Dichloroethane-d4 and Bromofluorobenzene surrogate recoveries in sample 108-S00-001 demonstrated a low bias and the associated sample results were qualified as estimated based on the surrogate recoveries.

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP semivolatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Pentachlorophenol, Acenaphthene, 4-Nitrophenol, and Pyrene were acceptable and therefore no data required qualification. The Acenaphthene LCS percent recoveries demonstrated a low bias and the associated sample results were qualified as estimated. Since 4-Nitrophenol, Pentachlorophenol, and Pyrene LCS precision and recovery demonstrated a high bias and the associated sample results were nondetected, data did not require qualification.

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP-pesticide/PCB analysis in this SDG. Although this is a protocol violation, the associated LCS and surrogate recoveries were acceptable and data did not require qualification.

- Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable with the exception of Alkalinity (Bicarbonate & Carbonate). Although this is a protocol violation the associated LCS recoveries were acceptable and therefore the data did not require qualification.

- A post-digest spike sample was not performed for Nickel. Although this is a protocol violation, the data was not affected and therefore was not qualified.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 0.45 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to low RRFs in the initial calibration, Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in samples 108-S02-006, 108-S02-010*, 108-S02-012, 108-S02-007, 108-S01-004, 108-S00-001, 108-S01-011, 108-S01-010, and 108-S01-003, and Acetone and 2-Butanone results were rejected in samples 108-S02-010DL*, 108-S00-001RE, 108-S01-005, 108-S01-015, 108-S02-001, 108-S02-002, 108-S02-004, and 108-S02-005, 108-S02-020*, 108-S02-022, 108-S02-022DL, and 108-S02-019.

- Due to low RRFs in the continuing calibration, Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in samples 108-S02-006, 108-S02-010*, 108-S02-012, 108-S02-007, 108-S01-004, 108-S00-001, 108-S01-011, 108-S01-010, and 108-S01-003, Acetone, 2-Butanone, and 1,2-Dibromo-3-chloropropane nondetected results were rejected in samples 108-S01-005, 108-S01-015, 108-S02-001, 108-S02-002, 108-S02-004, and 108-S02-005, and Acetone nondetected results were rejected in samples, 108-S02-010DL*, 108-S00-001RE, 108-S02-020*, 108-S02-022, 108-S02-022DL, and 108-S02-019.

B. Due to technical holding time, instrument calibration, surrogate recovery, common laboratory contamination, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound results are qualified as estimated in six samples.

- Due to initial calibration problems, Acetone and 2-Butanone results were qualified as estimated in twenty-one samples and 2-Hexanone and 1,2,4-Trichlorobenzene results were qualified as estimated in nine samples

- Due to continuing calibration problems, Acetone results were qualified as estimated in six samples, Chloromethane and Vinyl chloride results were qualified as estimated in nine samples, and Bromomethane results were qualified as estimated in six samples.

- Due to common laboratory contamination problems, Acetone was qualified nondetect in three samples.

- Due to surrogate recovery problems, all volatile compound results were qualified as estimated in one sample and all volatile compound detected results were qualified as estimated in one sample.

- Due to compound quantitation problems, Chlorobenzene was qualified as estimated in two samples.

- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S02-010*, 108-S00-001, and 108-S02-022 were reanalyzed due to surrogate exceeding acceptance criteria or diluted due to sample results exceeding the calibration range. For samples 108-S02-010* and 108-S02-022, all results except Chlorobenzene should be considered the most usable. The Chlorobenzene results for samples 108-S02-010DL* and 108-S02-022DL should be considered the most usable. The reanalysis of sample 108-S00-001RE was outside of the technical holding time and therefore the original result, 108-S00-001, should be considered the most usable.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration, common laboratory contamination, compound quantitation, and LCS problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, 3-Nitroaniline and 2,4-Dinitrophenol results were qualified as estimated in thirteen samples.
- Due to continuing calibration problems, Hexachlorocyclopentadiene and 4-Nitrophenol results were qualified as estimated in nine samples and 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, and Benzo(b)fluoranthene results were qualified as estimated in three samples.
- Due to LCS problems, Acenaphthene results were qualified as estimated in thirteen samples.
- Due to common laboratory contamination problems, Bis(2-ethylhexyl)phthalate results were qualified nondetect in ten samples.
- Due to compound quantitation problems, Naphthalene was qualified as estimated in two samples.
- All tentatively identified compounds were qualified (NJ).
- All detected results reported below the CRQL were qualified as estimated.

C. Samples 108-S01-010 and 108-S02-020* were diluted due to sample results exceeding the calibration range. For samples 108-S01-010 and 108-S02-020*, all results except Naphthalene should be considered the most usable. The Naphthalene results for samples 108-S01-010DL and 108-S02-020DL* should be considered the most usable.

Pesticide/PCB Analysis

A. No results for pesticide/PCB analysis were rejected in this SDG.

B. Due to instrument calibration and LCS problems in the pesticide/PCB analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, Heptachlor and 4,4'-DDE results were qualified as estimated in two samples.

C. No samples were reextracted or reanalyzed for CLP pesticide/PCB analysis in this SDG.

CLP Metals Analysis

A. Due to severe problems in the MS recovery in the metals analysis, selected sample results were rejected. The findings were as follows:

- Due to low recovery in the MS, Lead nondetected results were rejected in all samples.

B. Due to calibration blank and method blank contamination, MS, graphite furnace atomic absorption QC, and ICP serial dilution problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum was qualified nondetect in seventeen samples, Antimony was qualified nondetect in twelve samples, Arsenic was qualified nondetect in fourteen samples, Iron and Selenium were qualified nondetect in three samples, Lead was qualified as nondetect in one sample, Manganese was qualified nondetect in two samples, Nickel was qualified nondetect in fourteen samples, and Vanadium and Molybdenum were qualified nondetect in nine samples.

- Due to MS recovery problems, Lead , Nickel, and Selenium results were qualified as estimated in seventeen samples and Silver detected results were qualified as estimated in two samples.

- Due to low percent recovery in the GFAA QC, Thallium was qualified as estimated in one sample.

- Due to precision problems in the ICP serial dilution, Calcium, Iron, Manganese, Potassium, and Sodium were qualified as estimated in seventeen samples.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

Non-CLP Inorganic and Physical Analysis

A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.

B. Due to instrument calibration and MS/MSD problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to low percent recovery in the ICV, Phosphate results were qualified as estimated in three samples.

- Due to recovery problems in the MS/MSD, Alkalinity (Bicarbonate) results were qualified as estimated in two samples, Bromide detected results were qualified as estimated in four samples, and Phosphate detected results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW02

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: February 25, 1999

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Metals, TPH Gasoline, TPH Extractables and Non-CLP Inorganic and Physical Analysis

The wrong contract task order (CTO) number (No.) was referenced on page 1 of the data validation report. The CTO No. should be 069-108B01 not 069-109B01.

CLP Volatiles

1. Holding times: Only the target compounds benzene, toluene, ethylbenzene, and xylenes (total) in sample 108-S03-001DL; toluene, ethylbenzene, and xylenes (total) in sample 108-S03-001DL; benzene in sample 108-S03-001DL1; chloroethane, 1,1-dichloroethene, and 1,1-dichloroethane in sample 108-S05-012DL; and vinyl chloride, benzene, toluene, ethylbenzene, chlorobenzene, xylenes (total), and cis-1,2-dichloroethene in samples 108-S01-001DL and 108-S01-002DL were qualified as estimated.

2. Blank contamination: No field blanks were included in this SDG. The trip blanks, samples 108-S00-002 and 108-S00-003 were free of target compounds.

3. Field Duplicate: All relative percent differences (RPD) refer to field duplicate samples 108-S01-001/108-S01-002.

CLP Semivolatiles

1. Surrogate recovery: The terphenyl-d14 recovery in sample 108-S01-002 was outside QC limits. No data qualifications were required because only one base/neutral surrogate was outside QC limits in the sample.

2. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in full validation samples 108-S01-001 and 108-S01-001DL.

3. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The samples were found to be correctly quantitated.

CLP Metals

1. Blank contamination: The target analyte copper was also qualified in sample 108-S04-002 based on continuing calibration blank (CCB) contamination.

TPH Gasoline

1. TCL Identification: The target compound gasoline range organics was identified correctly in the full validation samples. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected gasoline range organic results in samples 108-S01-001, 108-S01-002, and 108-S03-001 were qualified as estimated. The fuel patterns in these samples did not show a reasonable match to the gasoline standard used for calibration.

TPH Extractable Analysis

1. TCL Identification: The target compound diesel range organics and/or motor oil range organics were identified correctly in the full validation samples. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected results for diesel range organics in samples 108-S01-001, 108-S01-002, and 108-S03-001 and motor oil range organics in samples 108-S01-001 and 108-S01-002 were qualified as estimated. The fuel patterns in these samples did not show a reasonable match to the diesel or motor oil standards used for calibration.

Non-CLP Inorganic and Physical Analysis

1. Analyte quantitation and reported detection limits. The laboratory reported detection limit for sulfide was 1.0 mg/L not 0.45 mg/L as listed in the data validation report.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2544A
Review Date:	December 22 through December 23, 1997
Sample Delivery Group (SDG) No.:	AAW02

Sample Nos.:

108-S01-001*	108-S05-008	108-S04-007	108-S01-012MS
108-S01-001DL*	108-S05-009	108-S04-001	108-S01-012MSD
108-S01-002	108-S05-009DL	108-S04-001RE	108-S01-012DUP
108-S01-002DL	108-S05-010	108-S04-003	108-S05-012MS
108-S01-012	108-S05-002	108-S04-002	108-S05-012MSD
108-S02-015	108-S05-001	108-S03-003	108-S05-012REP
108-S00-002	108-S05-001DL	108-S03-003RE	108-S04-001MS
108-S05-003	108-S05-012	108-S03-001*	108-S04-001MSD
108-S05-003DL	108-S05-012DL	108-S03-001DL*	108-S03-002MS
108-S05-004	108-S00-003	108-S03-001DL1*	108-S03-002DUP
108-S05-004DL		108-S03-002	

* Full Validation Sample

Matrix:	Water
Collection Date(s):	October 30 through November 3, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

* Holding times
  GC/MS instrument performance check
* Initial and continuing calibrations
* Blanks
* Surrogate recovery
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits
  System performance
* Overall assessment of data for the SDG

CLP Inorganic Parameters

* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
  ICP interference check sample
  GFAA quality control
* ICP serial dilution
  Sample result verification
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

* Method compliance
* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
* Surrogate recovery
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

LE 1

CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 7-8	√	N/A	pg. 8	pg. 8	pg. 8-10	√	√	pg. 11
SVOA	√	√	pg. 13	N/A	pg. 13-14	pg. 14	pg. 14-15	√	pg. 15	pg. 15-16
Metals	√	N/A	pg. 18	√	√	pg. 17-18	√	N/A	pg. 19	pg. 20
TPHG	√	√	pg. 21	N/A	√	√	√	N/A	N/A	√
TPHE	√	√	pg. 23	N/A	pg. 23-24	√	√	N/A	N/A	√
Alkalinity	√	N/A	pg. 24-25	pg. 25	√	√	√	N/A	N/A	√
Sulfide	√	N/A	√	√	√	√	√	N/A	N/A	√
TOC	√	N/A	√	√	√	√	√	N/A	N/A	√
TDS	√	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	pg. 26	pg. 27	√	√	√	N/A	N/A	√
Chloride	√	N/A	√	√	√	√	√	N/A	N/A	√
Fluoride	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfate	√	N/A	√	√	√	√	√	N/A	N/A	√
Phosphate	√	N/A	pg. 26-27	√	√	√	√	N/A	N/A	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-S01-001*, 108-S01-001DL*, 108-S03-001*, 108-S03-001DL*, and 108-S03-001DL1*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 12	√	N/A	N/A
SVOA	√	√	√	√	pg. 16	√	N/A	N/A
Metals	N/A	√	√	√	N/A	N/A	√	pg. 20
TPHG	N/A	√	√	√	N/A	N/A	N/A	N/A
TPHE	N/A	√	√	pg. 25	N/A	N/A	N/A	N/A
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 27	N/A	N/A	N/A	N/A
TOC	N/A	√	√	√	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

- All volatile compounds in samples 108-S01-001DL* 108-S01-002DL 108-S05-012DL 108-S03-001DL* 108-S03-001DL1*

The analysis holding time of 14 days for preserved waters was exceeded by three days in samples 108-S01-001DL* 108-S01-002DL

The analysis holding time of 14 days for preserved waters was exceeded by one day in samples 108-S05-012DL 108-S03-001DL*

The analysis holding time of 14 days for preserved waters was exceeded by 13 days in sample 108-S03-001DL1

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in samples 108-S04-001 108-S04-001RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S04-001	Toluene-d8	125	80-120
108-S04-001RE	Toluene-d8	141	80-120

High percent recoveries indicate that detected results may be biased high.

B. The other surrogate outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S02-015	Toluene-d8	128	80-120

Although the above listed percent recovery demonstrates a high bias, the associated sample results are nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The percent recoveries (%R) and relative percent differences (RPD) were within the CLP limits.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the following exception:

LCS ID	Compound	RPD	QC Limits
VBLKGJBS/BSD	Bromomethane	77	≤40
VBLKGGBS/BSD	Bromomethane	56	≤40
VBLKGGBS/BSD	1,2-Dichloroethene	21	≤20
VBLKGRBS/BSD	Bromomethane	65	≤40
VBLKGPBS/BSD	Bromomethane	114	≤40
VBLKGPBS/BSD	Chloroethane	77	≤40
VBLKGPBS/BSD	1,1-Dichloroethene	67	≤40
VBLKGPBS/BSD	Carbon disulfide	67	≤40

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Methylene chloride in sample 108-S05-012

Acetone and Methylene chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks and field blanks.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone in sample 108-S03-001DL1*

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/26/97	1,1-Dichloroethene	32.9
11/26/97	Acetone	52.9
11/26/97	Carbon disulfide	32.0
11/26/97	2-Hexanone	46.51

B. Due to initial calibration problems, the following nondetected results are rejected (Rf).

• Acetone and 2-Butanone in samples	108-S01-001*	108-S05-004DL	108-S00-003
	108-S01-001DL*	108-S05-008	108-S04-007
	108-S01-002	108-S05-009	108-S04-001
	108-S01-002DL	108-S05-009DL	108-S04-001RE
	108-S01-012	108-S05-010	108-S04-003
	108-S02-015	108-S05-002	108-S04-002
	108-S00-002	108-S05-001	108-S03-003
	108-S05-003	108-S05-001DL	108-S03-001*
	108-S05-003DL	108-S05-012	108-S03-001DL*
	108-S05-004	108-S05-012DL	108-S03-002
• 2-Butanone in sample	108-S03-001DL1*		

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
11/12/97	Acetone	0.026
11/12/97	2-Butanone	0.044
11/26/97	2-Butanone	0.040

C. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Bromomethane and Acetone in samples	108-S01-001DL*	108-S05-009	108-S05-012
	108-S01-002DL	108-S05-010	108-S00-003
	108-S05-003	108-S05-002	108-S04-007
	108-S05-004	108-S05-001	108-S04-001
	108-S05-008		
• Bromomethane and 1,2-Dibromo-3-chloropropane in samples	108-S04-001RE	108-S04-002	108-S03-001*
	108-S04-003	108-S03-003	108-S05-003DL
• Bromomethane in samples	108-S05-004DL	108-S05-001DL	108-S03-001DL*
	108-S05-009DL	108-S05-012DL	108-S03-002
• Bromomethane and 2-Hexanone in sample		108-S03-001DL1*	

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% with the following exceptions:

Calibration Date	Compound	%D
11/16/97	Bromomethane	31.6
11/16/97	Acetone	26.9
11/17/97 (VAB17)	Bromomethane	38.6
11/17/97 (VAB17)	1,2-Dibromo-3-chloropropane	36.7
11/17/97 (VBB17)	Bromomethane	37.3
11/30/97	Bromomethane	31.3
11/30/97	2-Hexanone	66.7

D. Due to continuing calibration problems, the following nondetected results are as rejected (Rf).

• Acetone in samples	108-S01-001*	108-S01-012	108-S00-002
	108-S01-002	108-S02-015	
• Acetone and 2-Butanone in samples	108-S01-001DL*	108-S05-009	108-S05-012
	108-S01-002DL	108-S05-010	108-S00-003
	108-S05-003	108-S05-002	108-S04-007
	108-S05-004	108-S05-001	108-S04-001
	108-S05-008	108-S05-001DL	108-S03-001DL*
	108-S05-004DL	108-S05-012DL	108-S03-002
	108-S05-009DL		
• Acetone, 2-Butanone, and 1,2-Dibromo-3-chloropropane in samples	108-S04-001RE	108-S04-002	108-S03-001*
	108-S04-003	108-S03-003	108-S05-003DL
• Acetone, 2-Butanone, and 2-Hexanone in sample		108-S01-003-DL1*	

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
11/13/97	Acetone	0.032
11/16/97	Acetone	0.033
11/16/97	2-Butanone	0.042
11/17/97 (VAB17)	Acetone	0.032
11/17/97 (VAB17)	2-Butanone	0.045
11/17/97 (VAB17)	1,2-Dibromo-3-chloropropane	0.038
11/17/97 (VBB17)	Acetone	0.031
11/17/97 (VBB17)	2-Butanone	0.043
11/30/97	Acetone	0.046
11/30/97	2-Butanone	0.030
11/30/97	2-Hexanone	0.046

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S01-001*/108-S01-002:

- 200% for 1,3-Dichlorobenzene

The following RPDs were obtained for the field duplicate samples 108-S01-001DL*/108-S01-002DL:

- 44% for Vinyl chloride
- 45% for Benzene
- 46% for Toluene
- 46% for Chlorobenzene
- 49% for Ethylbenzene
- 50% for Xylene
- 49% for cis-1,2-Dichloroethene

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No sample results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

- Vinyl chloride, Benzene, Toluene, Ethylbenzene, Chlorobenzene, Xylenes (total), and cis-1,2-Dichloroethene in samples 108-S01-001* 108-S01-002
- Methylene chloride in sample 108-S05-003
- Vinyl chloride in samples 108-S05-004 108-S05-001
- Chloroethane and 1,1-Dichloroethane in sample 108-S05-009
- Chloroethane, 1,1-Dichloroethene, and 1,1-Dichloroethane in sample 108-S05-012
- Benzene, Toluene, Ethylbenzene, and Xylenes (total) in sample 108-S03-001*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-S01-001, 108-S01-001DL*, 108-S03-001*, 108-S03-001DL*, and 108-S03-001DL1**

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles.

II. Surrogate Recovery

A. Surrogate recoveries were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Pentachlorophenol, Acenaphthene, 4-Nitrophenol, and Pyrene were acceptable and therefore no data required qualification. The Acenaphthene LCS percent recoveries demonstrated a low bias and the associated sample results were qualified as estimated. Since 4-Nitrophenol, Pentachlorophenol, and Pyrene LCS precision and recovery demonstrated a high bias and the associated sample results were nondetected, data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following nondetected results are qualified as estimated (UJh).

- Acenaphthene in samples 108-S01-001* 108-S01-002 108-S01-001DL* 108-S01-002DL

The result obtained in the analysis of the LCS was not within the control limits as shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKBDBS/BSD	Acenaphthene	-	42	46-118	69	≤31

Detected results may be biased low and false nondetects may have been reported.

C. The result obtained in the analysis of the LCS was not within the control limits as shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKBDBS/BSD	Pentachlorophenol	110	117	9-103	-	-
SBLKBDBS/BSD	4-Nitrophenol	-	82	10-80	-	-
SBLKBDBS/BSD	Pyrene	-	-	-	69	≤31

Although the above listed recoveries demonstrate a high bias, the associated sample results were nondetected and therefore not qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Diethylphthalate in samples 108-S01-001* 108-S01-002
- Bis(2-ethylhexyl)phthalate in sample 108-S01-002

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No sample results were qualified based on semivolatile contaminants found in the method blank and no field blanks were identified for semivolatile analysis in this SDG.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- 3-Nitroaniline and 2,4-Dinitrophenol in samples 108-S01-001* 108-S01-002 108-S01-001DL* 108-S02-002DL

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/7/97	3-Nitroaniline	34.8
11/7/97	2,4-Dinitrophenol	30.5

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

- 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, and 4-Nitroaniline in samples 108-S01-001* 108-S01-002

- Hexachlorocyclopentadiene and 4-Nitrophenol in samples — 108-S01-001DL*, 108-S01-002DL

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/10/97	4-Chloroaniline	27.1
11/10/97	3-Nitroaniline	44.0
11/10/97	2,4-Dinitrophenol	31.4
11/10/97	4-Nitrophenol	43.1
11/10/97	4-Nitroaniline	38.0
11/11/97	Hexachlorocyclopentadiene	30.2
11/11/97	4-Nitrophenol	29.4

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S01-001*/108-S01-002:

- 33% for 1,4-Dichlorobenzene
- 67% for Diethylphthalate
- 200% for Bis(2-ethylhexyl)phthalate

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

Detected results reported below the CRQL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

B. The following detected results are qualified as estimated (Jh).

- 2,4-Dimethylphenol in samples 108-S01-001* 108-S01-002*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-S01-001* and 108-S01-001DL*

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in samples 108-S01-001* and 108-S01-001DL*.

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in samples 108-S01-001* and 108-S01-001DL*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S01-001* 108-S01-002 108-S01-012 108-S02-015 108-S05-003	108-S05-004 108-S05-008 108-S05-009 108-S05-010 108-S05-002	108-S05-001 108-S05-012 108-S04-007 108-S04-001 108-S04-003	108-S04-002 108-S03-003 108-S03-001* 108-S03-002
• Antimony in samples	108-S01-002 108-S05-012	108-S04-001	108-S04-002	108-S03-001*
• Copper in samples	108-S04-007	108-S04-001		
• Iron in samples	108-S05-012	108-S04-003		
• Lead in sample	108-S03-001*			
• Manganese in sample	108-S04-001			
• Vanadium in samples	108-S05-003 108-S05-004 108-S05-009	108-S05-010 108-S05-002	108-S05-012 108-S04-001	108-S03-001* 108-S03-002
• Molybdenum in samples	108-S01-012 108-S05-003	108-S05-009	108-S05-010	108-S03-003

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	CCB	121.8
Antimony	CCB	3.5
Calcium	CCB	74.7
Copper	CCB	-5.10
Iron	PB	15.27
Iron	CCB	29.7
Lead	CCB	3.3
Magnesium	CCB	67.6
Manganese	CCB	2.6
Nickel	CCB	0.6
Potassium	CCB	145.3
Sodium	CCB	-376.5
Thallium	CCB	-2.3
Vanadium	CCB	2.6
Molybdenum	CCB	0.9

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Due to accuracy problems in the MS analysis, the following detected and nondetected results are qualified as estimated (Jc/UJc).

• Iron, Lead, and Thallium in samples	108-S01-001*	108-S05-009	108-S04-001
	108-S01-002	108-S05-010	108-S04-003
	108-S01-012	108-S05-002	108-S04-002
	108-S02-015	108-S05-001	108-S03-003
	108-S05-003	108-S05-012	108-S03-001*
	108-S05-004	108-S04-007	108-S03-002
	108-S05-008		

The recoveries that did not meet the CLP limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S01-012MS	Iron	69.1	75-125
108-S01-012MS	Lead	59.4	75-125
108-S01-012MS	Thallium	70.2	75-125

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤25 for waters and ≤35 for soils.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. Due to ICP serial dilution problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Iron, Potassium, and Sodium in samples	108-S01-001*	108-S05-004	108-S05-001	108-S04-002
	108-S01-002	108-S05-008	108-S05-012	108-S03-003
	108-S01-012	108-S05-009	108-S04-007	108-S03-001*
	108-S02-015	108-S05-010	108-S04-001	108-S03-002
	108-S05-003	108-S05-002	108-S04-003	

The percent difference between the original sample result and the serial dilution result was outside the QC limits of 10% for analyte concentrations greater than 50x the IDL as shown below.

Sample ID	Analyte	Original Concentration	50x IDL	%D
108-S01-012	Iron	3652.52	565	24.2
108-S01-012	Potassium	392672.05	1190	12.3
108-S01-012	Sodium	51995.95	9500	15.3

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S01-001*/108-S01-002:

- 200% for Antimony
- 200% for Cadmium
- 27% for Nickel
- 88% for Zinc

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-S01-001* and 108-S03-001*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Due to analytical spike percent recovery problems, the following nondetected results are qualified as estimated (UJh).

- Thallium in sample 108-S03-001*

The analytical spike recovery result did not meet the 85-115% recovery criteria for accuracy. The percent recovery for each analyte is presented below.

Sample	Analyte	%Recovery
108-S03-001*	Thallium	68.0

The analytical spike recovery result in the sample listed above shows an analytical deficiency. The low analytical spike result indicates a low bias in detected results or possible false nondetects in nondetected results.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL .

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met for TPHG.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and therefore no data required qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks and no field blanks were identified for TPHG analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. For the field duplicate pair 108-S01-001*/108-S01-002 there were no RPDs above the ±25% criteria.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S01-001 and 108-S03-001**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for TPHE.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

- All TPHE compounds in samples 108-S03-003 108-S03-003RE

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S03-003	o-Terphenyl	49	60-140%
108-S03-003RE	o-Terphenyl	50	60-140%

Low recoveries indicate that detected and nondetected results may be biased low.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed in this SDG. Although this is a protocol violation, the associated surrogate recoveries, except for o-Terphenyl in two samples, were acceptable and therefore no data required qualification. The o-Terphenyl surrogate recoveries in samples 108-S03-003 and 108-S03-003RE demonstrated a low bias and the associated results were qualified as estimated based on these surrogate recoveries.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Diesel range organics in samples	108-S01-001*	108-S03-003	108-S03-001*
	108-S01-002	108-S03-003RE	

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Compound	LCS % R	LCSD % R	QC Limits	RPD	QC Limits
PBLKHCLCS/D	Diesel range organics	53	50	60-140	-	≤50
PBLKHQLCS/D	Diesel range organics	46	48	60-140	-	≤50

Detected results for Diesel range organics may be biased low and false nondetects may have been reported.

V. Blank Contamination

A. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks and no field blanks were identified for TPHE analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. For the field duplicate pair 108-S01-001*/108-S01-002 there were no RPDs above the ±25% criteria.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S01-001* and 108-S03-001*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total dissolved solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, Nitrite, and Total organic carbon.

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, Fluoride, and Total organic carbon, the 14 day analysis holding time requirements for Alkalinity, the 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and the 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method.

B. All Initial and Continuing calibration verification frequency percent recoveries (%R) were within the 90-110% QC limits. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. No contaminant concentrations were found in the method blanks and no field blanks were identified for non-CLP inorganic or physical analysis in this SDG.

IV. Matrix Spike (MS)

A. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

- Bromide in samples 108-S01-001* 108-S01-012 108-S02-015

Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

Sample ID	Analyte	MS %R	MSD %R	QC Limits
108-S01-012	Bromide	166	135	75-125

Spike recoveries above 125% indicate that detected results may be biased high.

B. Other percent recoveries outside QC limits are listed below.

Sample ID	Analyte	MS %R	MSD %R	QC Limits
108-S01-012	Phosphate	138	-	75-125

Although the above listed percent recovery demonstrates a high bias the associated sample results are nondetected and therefore were not qualified.

V. Matrix Duplicate

A. Due to precision problems in the matrix duplicate analysis, the following detected results are qualified as estimated (Jd).

- Bromide in samples 108-S01-001* 108-S01-012 108-S02-015

The relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

Duplicate Sample ID	Analyte	RPD
108-S01-012	Bromide	20.6

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S01-001* and 108-S03-001*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 0.45 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for TPHG analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and therefore no data required qualification.

- Matrix spike/matrix spike duplicate sample analyses were not performed for TPHE analysis in this SDG. Although this is a protocol violation, the associated surrogate recoveries, except for o-Terphenyl in two samples, were acceptable and therefore no data required qualification. The o-Terphenyl surrogate recoveries in samples 108-S03-003 and 108-S03-003RE demonstrated a low bias and the associated results were qualified as estimated based on these surrogate recoveries.

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP semivolatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Pentachlorophenol, Acenaphthene, 4-Nitrophenol, and Pyrene were acceptable and therefore no data required qualification. The Acenaphthene LCS percent recoveries demonstrated a low bias and the associated sample results were qualified as estimated. Since 4-Nitrophenol, Pentachlorophenol, and Pyrene LCS precision and recovery demonstrated a high bias and the associated sample results were nondetected, data did not require qualification.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 0.45 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to low RRFs in the initial calibration, Acetone and 2-Butanone nondetected results were rejected in samples 108-S01-001*, 108-S01-001DL*, 108-S01-002, 108-S01-002DL, 108-S01-012, 108-S02-015, 108-S00-002, 108-S05-003, 108-S05-003DL, 108-S05-004, 108-S05-004DL, 108-S05-008, 108-S05-009,

108-S05-009DL, 108-S05-010, 108-S05-002, 108-S05-001, 108-S05-001DL, 108-S05-012, 108-S05-012DL, 108-S00-003, 108-S04-007, 108-S04-001, 108-S04-001RE, 108-S04-003, 108-S04-002, 108-S03-003, 108-S03-001*, 108-S03-001DL*, and 108-S03-002 and 2-Butanone nondetected results were rejected in sample 108-S03-001DL1*.

- Due to low RRFs in the continuing calibration, Acetone nondetected results were rejected in samples 108-S01-001*, 108-S01-002, 108-S01-012, 108-S02-015, and 108-S00-002, Acetone and 2-Butanone nondetected results were rejected in samples 108-S01-001DL*, 108-S01-002DL, 108-S05-003, 108-S05-004, 108-S05-008, 108-S05-004DL, 108-S05-009DL, 108-S05-009, 108-S05-010, 108-S05-002, 108-S05-001, 108-S05-001DL, 108-S05-012DL, 108-S05-012, 108-S00-003, 108-S04-007, 108-S04-001, 108-S03-001DL*, and 108-S03-002, Acetone, 2-Butanone, and 1,2-Dibromo-3-chloropropane nondetected results were rejected in samples 108-S04-001RE, 108-S04-003, 108-S04-002, 108-S03-003, 108-S03-001*, and 108-S05-003DL, and Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in sample 108-S01-003DL1*.

B. Due to technical holding time, instrument calibration, surrogate recovery, common laboratory contamination, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound results are qualified as estimated in five samples.
- Due to initial calibration problems, 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone results were qualified as estimated in one sample.
- Due to continuing calibration problems, Bromomethane results were qualified as estimated in twenty-six samples, Acetone results were qualified as estimated in thirteen samples, 1,2-Dibromo-3-chloropropane results were qualified as estimated in six samples, and 2-Hexanone results were qualified as estimated in one sample.
- Due to common laboratory contamination problems, Methylene chloride was qualified nondetect in one sample.
- Due to surrogate recovery problems, all volatile compound detected results were qualified as estimated in two samples.
- Due to compound quantitation problems, Vinyl chloride detected results were qualified as estimated in four samples, cis-1,2-Dichloroethene, 1,1-Dichloroethane, and Chloroethane results were qualified as estimated in two samples, Methylene chloride, Chlorobenzene, and 1,1-Dichloroethene detected results were qualified as estimated in one sample, and Benzene, Toluene, Ethylbenzene, and Xylenes (total) detected results were qualified as estimated in three samples.
- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S01-001*, 108-S01-002, 108-S05-003, 108-S05-004, 108-S05-009, 108-S05-001, 108-S05-012, and 108-S03-001* were diluted due to results exceeding the calibration range and sample 108-S04-001 was reanalyzed due to surrogate recovery outside the acceptance criteria. For samples 108-S01-001* and 108-S01-002, all results except Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylenes (total), and cis-1,2-Dichloroethene should be considered the most usable. The Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylenes (total), and cis-1,2-Dichloroethene results for samples 108-S01-001DL* and 108-S01-002DL should be considered the most usable. For sample 108-S05-003, all results except Methylene chloride should be considered the most usable. The Methylene chloride results for sample 108-S05-003DL should be considered the most usable. For samples 108-S05-004 and 108-S05-001, all results except Vinyl chloride should be considered the most usable. The Vinyl chloride results for samples 108-S05-004DL and 108-S05-001DL should be considered the most usable. For sample 108-S05-009, all results except Chloroethane should be considered the most usable. The Chloroethane results for sample 108-S05-009DL should be considered the most usable. For sample 108-S05-012, all results except Chloroethane, 1,1-Dichloroethene, and 1,1-Dichloroethane should be considered the most usable. The Chloroethane, 1,1-Dichloroethene, and 1,1-Dichloroethane results for sample 108-S05-012DL should be considered the most usable. For sample 108-S03-001*, all results except Benzene, Toluene, Ethylbenzene, and Xylenes (total) should be considered the most usable. The Toluene, Ethylbenzene, and Xylenes (total) results for sample 108-S03-001DL* and the Benzene results for sample 108-S03-001DL1* should be considered the most usable. The reanalysis of sample 108-S04-001RE was also outside of acceptance criteria and therefore the original result, 108-S04-001, should be considered the most usable.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration, common laboratory contamination, compound quantitation, and LCS problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, 3-Nitroaniline and 2,4-Dinitrophenol results were qualified as estimated in four samples.
- Due to continuing calibration problems, 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitroaniline, and Hexachlorocyclopentadiene results were qualified as estimated in two samples and 4-Nitrophenol results were qualified as estimated in four samples
- Due to common laboratory contamination problems, Diethylphthalate was qualified nondetect in two samples and Bis(2-ethylhexyl)phthalate results were qualified nondetect in one sample.
- Due to LCS problems, Acenaphthene results were qualified as estimated in four samples.
- Due to compound quantitation problems, 2,4-Dimethylphenol was qualified as estimated in two samples.
- All tentatively identified compounds were qualified (NJ).
- All detected results reported below the CRQL were qualified as estimated.

C. Samples 108-S01-001* and 108-S01-002 were diluted due to sample results exceeding the calibration range. For samples 108-S01-001* and 108-S01-002, all results except 2,4-Dimethylphenol should be considered the most usable. The 2,4-Dimethylphenol results for samples 108-S01-001DL* and 108-S01-002DL should be considered the most usable.

CLP Metals Analysis

A. No results for CLP Metals analysis were rejected in this SDG.

B. Due to calibration blank and method blank contamination, MS, graphite furnace atomic absorption QC, and ICP serial dilution problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum was qualified nondetect in nineteen samples, Antimony and Molybdenum were qualified nondetect in five samples, Copper and Iron were qualified nondetect in two samples, Manganese and Lead were qualified nondetect in one sample, and Vanadium was qualified nondetect in nine samples.

- Due to MS recovery problems, Iron, Lead, and Thallium results were qualified as estimated in nineteen samples.

- Due to low percent recovery in the GFAA QC, Thallium was qualified as estimated in one sample.

- Due to precision problems in the ICP serial dilution, Iron, Potassium, and Sodium results were qualified as estimated in nineteen samples.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to surrogate and LCS problems in the TPH extractables analysis, several samples were qualified as estimated. The findings were as follows:

- Due to surrogate recovery problems, all TPHE compound results were qualified as estimated in two samples.

- Due to LCS recovery problems, Diesel range organics results were qualified as estimated in five samples.

C. Sample 108-S03-003 was reextracted due to surrogate results exceeding the acceptance criteria. The reextracted sample also had low surrogate recovery and therefore the original sample results should be considered the most usable.

Non-CLP Inorganic and Physical Analysis

A. No results for non-CLP inorganic and physical analysis were rejected in this SDG

B. Due to MS/MSD and DUP problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to recovery problems in the MS/MSD, Bromide detected results were qualified as estimated in three samples.
- Due to precision problems in the DUP, Bromide results were qualified as estimated in three samples.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW03

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: February 25, 1999

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Pesticide/PCBs, CLP Metals, TPH Gasoline, TPH Extractables, and Non-CLP Inorganic and Physical Analysis

The wrong contract task order (CTO) number (No.) was referenced on page 1 of the data validation report. The CTO No. should be 069-108B01 not 069-109B01.

CLP Volatiles

1. Holding times: Only the detected target compounds chlorobenzene in samples 108-S02-008DL and 108-S02-013DL; vinyl chloride, 1,1-dichloroethane, and cis-1,2-dichloroethene in sample 108-S05-015DL; xylenes (total) in sample 108-S05-005DL; cis-1,2-dichloroethene in sample 108-S06-001DL; benzene, chlorobenzene, ethylbenzene, and xylene (total) in sample 108-S01-007DL1, and vinyl chloride, toluene, and cis-1,2-dichloroethene in sample 108-S01-007DL2 were qualified as estimated.

2. Other qualifications: The target compound 1,1-dichloroethane not 1,1-dichloroethene was qualified as estimated in sample 108-S05-015.

CLP Semivolatiles

1. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in the full validation samples.

2. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The samples were found to be correctly quantitated.

CLP Pesticide/PCB

1. Pesticide cleanup checks: Florisil checks were performed and all recoveries were within specified QC limits.

2. TCL identification: No pesticide/PCB compounds were detected in the full validation sample.

3. Compound quantitation: No pesticide/PCB compounds were detected in the full validation sample. The reported detection limits were consistent with Tetra Tech EMI's required reporting limits and reflect any dilutions and volumes.

CLP Metals

1. Matrix duplicate: The QC limit was ≤20 percent not ≤10 percent as indicated in the data validation report.

TPH Gasoline

1. TCL Identification: The target compound gasoline range organics was identified correctly in the full validation sample. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, the detected gasoline range organic result in sample 108-S01-008 was qualified as estimated. The fuel pattern in the sample did not show a reasonable match to the gasoline standard used for calibration.

TPH Extractable Analysis

1. TCL Identification: The target compounds diesel range organics and motor oil range organics were identified correctly in the full validation sample. No signs of false positives or false negatives were observed by the reviewer.

Non-CLP Inorganic and Physical Analysis

1. Blank Contamination: The target analyte, total organic carbon, not metal as indicated in the data validation report was detected in the method blank.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, Pei Jing, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2556A
Review Date:	December 31, 1997 through January 2, 1998
Sample Delivery Group (SDG) No.:	AAW03

Sample Nos.:

108-S05-011	108-S01-007*	108-S11-002	108-S01-008MS
108-S05-011RE	108-S01-007DL1*	108-S11-001	108-S01-008MSD
108-S05-007	108-S01-007DL2*	108-S21-001	108-S01-008DUP
108-S05-007DL	108-S01-008	108-S11-003	108-S01-012MS
108-S05-006	108-S01-012	108-S11-004	108-S01-012MSD
108-S05-016	108-S06-001	108-S11-004RE	108-S02-008MS
108-S05-015	108-S06-001DL	108-S11-005	108-S02-008MSD
108-S05-015DL	108-S02-008	108-S11-005RE	108-S11-002MS
108-S05-005*	108-S02-008DL	108-S05-006MS	108-S11-002MSD
108-S05-005DL*	108-S02-008RE	108-S05-006DUP	108-S21-001MS
108-S10-001	108-S02-013*	108-S01-007MS	108-S21-001MSD
108-S00-004	108-S02-013DL*	108-S01-007MSD	108-S21-001DUP
108-S00-004RE	108-S02-013RE*	108-S01-007DUP	

* Full Validation Sample

Matrix:	Water
Collection Date(s):	November 4 through November 5, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

* Holding times
  GC/MS instrument performance check
* Initial and continuing calibrations
* Blanks
* Surrogate recovery
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits
  System performance
* Overall assessment of data for the SDG

CLP Inorganic Parameters

* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
  ICP interference check sample
  GFAA quality control
* ICP serial dilution
  Sample result verification
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

* Method compliance
* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
* Surrogate recovery
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 7-8	pg. 8	N/A	pg. 9	pg. 9-10	pg. 10-12	pg. 12-13	pg. 13	pg. 13
SVOA	pg. 15	pg. 15-16	√	N/A	pg. 17	pg. 17	pg. 17-18	√	N/A	pg. 18
Pesticide/PCB	√	pg. 20	pg. 20	N/A	√	√	pg. 20-21	N/A	N/A	√
Metals	√	N/A	pg. 25	√	√	pg. 23-25	√	N/A	pg. 26	pg. 25,26
TPHG	√	√	√	√	√	√	√	N/A	N/A	√
TPHE	√	√	√	√	pg. 30	√	√	N/A	N/A	√
Alkalinity	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfide	√	N/A	√	√	√	√	√	N/A	N/A	√
TOC	√	N/A	√	√	√	pg. 32	√	N/A	N/A	√
TDS	√	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	√	√	√	√	√	N/A	N/A	√
Chloride	√	N/A	√	√	√	√	√	N/A	pg. 33	√
Fluoride	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfate	√	N/A	√	√	√	√	√	N/A	N/A	√
Phosphate	√	N/A	√	√	√	√	√	N/A	pg. 33	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-S05-005*, 108-S05-005DL*, 108-S01-007*, 108-S01-007DL1*, 108-S01-007DL2*, 108-S02-013*, 108-S02-013DL*, and 108-S02-013RE*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 14	√	N/A	N/A
SVOA	√	√	√	√	pg. 19	√	N/A	N/A
Pesticide/PCB	N/A	√	√	√	N/A	√	N/A	N/A
Metals	N/A	√	√	√	N/A	√	pg. 27	pg. 26-27
TPHG	N/A	√	√	√	N/A	N/A	N/A	N/A
TPHE	N/A	√	√	pg. 31	N/A	N/A	N/A	N/A
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 33	N/A	N/A	N/A	N/A
TOC	N/A	√	√	√	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to grossly exceeded holding times, the following detected results are estimated and the nondetected results are rejected (Jh/Rh).

• All volatile compounds in samples	108-S05-015DL	108-S00-004RE	108-S02-008DL
	108-S05-005DL*	108-S01-007DL2	

The analysis holding time of 14 days for preserved waters was exceeded by 23 days in samples	108-S05-015DL 108-S05-005DL*
The analysis holding time of 14 days for preserved waters was exceeded by 22 days in samples	108-S00-004RE 108-S01-007DL2
The analysis holding time of 14 days for preserved waters was exceeded by 21 days in sample	108-S02-008DL

B. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• All volatile compounds in samples	108-S01-007DL1*	108-S02-013DL*	108-S11-005RE
	108-S06-001DL	108-S11-004RE	

The analysis holding time of 14 days for preserved waters was exceeded by 12 days in samples	108-S01-007DL1* 108-S06-001DL
The analysis holding time of 14 days for preserved waters was exceeded by 11 days in samples	108-S02-013DL* 108-S11-004RE
The analysis holding time of 14 days for preserved waters was exceeded by one day in sample	108-S11-005RE

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (Ja/UJa).

• All volatile compounds in samples	108-S11-004	108-S11-005

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S11-004	Bromofluorobenzene	71	80-120
108-S11-005	Bromofluorobenzene	71	80-120

Low recoveries indicate that detected and nondetected results may be biased low.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in sample 108-S02-013*

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S02-013*	1,4-Dichloroethane-d4	128	80-120

High percent recoveries indicate that detected results may be biased high.

C. The other surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S05-011	Toluene-d8	142	80-120
108-S05-011RE	Bromofluorobenzene	121	80-120
108-S05-011RE	1,4-Dichloroethane-d4	132	80-120

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The recoveries that did not meet the QC limits are listed below.

Sample ID	Compound	MS %R	MSD % R	QC Limits	RPD	QC Limits
108-S01-007*	Acetone	217	215	0-200	-	-
108-S01-007*	2-Butanone	868	-	0-200	188	≤40
108-S01-007*	1,2-Dichloroethane	149	158	60-140	-	-
108-S01-007*	1,2-Dibromo-3-chloropropane	332	377	0-200	-	-
108-S01-007*	1,2-Dichlorpropane	-	143	60-140	-	-
108-S01-007*	2-Hexanone	-	210	0-200	102	≤40

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

B. Other RPDs outside of CLP limits are listed below.

Sample ID	Compound	RPD	QC Limits
108-S21-001	2-Butanone	14	≤40

Since the individual MS/MSD recoveries were acceptable, no data required qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits with the exceptions listed below.

B. The result obtained in the analysis of the LCS was not within the QC limits as shown below.

LCS ID	Compound	% R	QC Limits
VBLKNIBS/BSD	Acetone	206	0-200

Although the above listed percent recovery demonstrates a high bias, the associated sample results were nondetected and therefore were not qualified.

C. The other RPDs outside of the QC limits are listed below.

LCS ID	Compound	RPD	QC Limits
VBLKGRBS/BSD	Bromomethane	65	≤40
VBLKNVBS/BSD	Bromomethane	51	≤40
VBLKGPBS/BSD	Bromomethane	114	≤40
VBLKGPBS/BSD	Chloroethane	77	≤40
VBLKGPBS/BSD	1,1-Dichloroethene	67	≤40
VBLKGPBS/BSD	Carbon disulfide	67	≤40
VBLKOPBS/BSD	Chloromethane	77	≤40
VBLKOPBS/BSD	2-Butanone	70	≤40

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Acetone in samples 108-S02-013* 108-S21-001

Acetone and Methylene chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks.

C. Due to trip blank contamination, the following results are considered nondetected (UJb).

- cis-1,2-Dichloroethene in samples 108-S05-007, 108-S05-006, 108-S05-016, 108-S05-015DL, 108-S10-001, 108-S01-007DL2*, 108-S01-008, 108-S06-001DL, 108-S21-001, 108-S11-004, 108-S11-004RE, 108-S11-005, 108-S11-005RE

The following analytes were detected in the associated trip blanks at the concentrations noted below.

Compound	Blank ID	Concentration, µg/L
cis-1,2-Dichloroethene	108-S00-004	4

Detected results less than 5x the maximum blank contamination were qualified.

VI. Calibrations

A. Due to initial calibration problems, the following detected and nondetected results are qualified as estimated (Jf/UJf).

• Bromomethane and 2-Hexanone in samples	108-S11-002 108-S11-001 108-S21-001	108-S11-003 108-S11-004	108-S11-005 108-S11-005RE
• 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone in samples		108-S01-007DL1* 108-S06-001DL	108-S02-013DL* 108-S11-004RE

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/19/97	Bromomethane	31.2
11/19/97	2-Hexanone	31.9
11/26/97	1,1-Dichloroethene	32.9
11/26/97	Acetone	52.9
11/26/97	Carbon disulfide	32.0
11/26/97	2-Hexanone	46.5

B. Due to initial calibration problems, the following detected results are qualified as estimated and nondetected results are rejected (Jf/Rf).

• Acetone and 2-Butanone in samples	108-S01-007DL2* 108-S02-008DL 108-S00-004RE 108-S05-015DL 108-S05-005DL*	108-S05-011 108-S05-011RE 108-S05-007 108-S05-007DL 108-S05-006	108-S05-016 108-S05-015 108-S05-005* 108-S10-001 108-S00-004	108-S01-007* 108-S01-008 108-S06-001 108-S02-008 108-S02-013*

• Acetone in samples	108-S11-002 108-S11-001 108-S21-001	108-S11-003 108-S11-004	108-S11-005 108-S11-005RE
• 2-Butanone in samples	108-S01-007DL1* 108-S06-001DL	108-S02-013DL*	108-S11-004RE

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
11/29/97	Acetone	0.015
11/29/97	2-Butanone	0.028
12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.028
11/12/97	Acetone	0.026
11/12/97	2-Butanone	0.044
11/19/97	Acetone	0.045
11/26/97	2-Butanone	0.040

C. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Bromomethane in samples	108-S05-007 108-S05-006 108-S05-016 108-S05-015 108-S05-005*	108-S10-001 108-S01-008 108-S11-002 108-S11-001 108-S21-001	108-S11-003 108-S11-004 108-S11-005 108-S11-005RE
• Bromomethane and 2-Hexanone in samples	108-S01-007DL1* 108-S06-001DL	108-S02-013DL*	108-S11-004RE

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Calibration Date	Compound	%D
11/17/97	Bromomethane	37.3
11/19/97	Bromomethane	34.0
11/30/97	Bromomethane	31.3
11/30/97	2-Hexanone	66.7

D. Due to continuing calibration problems, the following detected results were qualified as estimated and the nondetected results are as rejected (Jf/Rf).

• Acetone, 2-Butanone, and 2-Hexanone in samples	108-S00-004RE 108-S01-007DL12* 108-S02-008DL 108-S01-007DL1*	108-S06-001DL 108-S02-013DL*	108-S11-004RE
• Acetone and 2-Butanone in samples	108-S05-007 108-S05-006 108-S05-016 108-S05-015 108-S05-005* 108-S10-001	108-S01-008 108-S05-011 108-S05-011RE 108-S00-004 108-S01-007* 108-S06-001	108-S02-008 108-S02-008DL 108-S05-007DL 108-S05-005DL* 108-S05-015DL

• Acetone in samples	108-S11-002 108-S11-001 108-S21-001	108-S11-003 108-S11-004	108-S11-005 108-S11-005RE

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
12/9/97	Acetone	0.011
12/9/97	2-Butanone	0.020
12/9/97	2-Hexanone	0.049
11/17/97	Acetone	0.031
11/17/97	2-Butanone	0.043
11/18/97	Acetone	0.028
11/18/97	2-Butanone	0.046
11/19/97	Acetone	0.037
11/30/97	Acetone	0.046
11/30/97	2-Butanone	0.030
11/30/97	2-Hexanone	0.046
12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.022

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time with the exceptions listed below.

B. Due to internal standard problems, the following nondetected results are qualified as estimated (UJe).

• Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene in sample 108-S05-011

The internal standard area counts in the samples listed above were less than one half of the reference standard and are listed below.

Sample	Internal Standard	Area	QC Limits
108-S05-011	1,2-Dichlorobenzene-d4	142245	157135-366649

Internal standard area counts of less than 50% of the standard area count may indicate a loss of instrument sensitivity.

C. The other internal standard area counts more than twice the reference standard are listed below.

Sample	Internal Standard	Area	QC Limits
108-S05-005*	1,2-Dichlorobenzene-d4	868026	138764-323782

Although the above listed area count demonstrates, a high bias the associated sample results were nondetected and therefore were not qualified.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S11-004/108-S11-005:

- 200% for Vinyl chloride
- 28% for cis-1,2-Dichloroethene

No RPDs were outside of the QC limits for field duplicate samples 108-S11-004RE/108-S11-005RE.

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

• Vinyl chloride in sample		108-S05-007
• Vinyl chloride, 1,1-Dichloroethene, and cis-1,2-Dichloroethene in sample		108-S05-015
• Xylenes (total) in sample		108-S05-005
• Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylenes (total) and cis-1,2-Dichloroethene in sample		108-S01-007*
• cis-1,2-Dichloroethene in sample		108-S06-001
• Chlorobenzene in samples	108-S02-008	108-S02-013*
• Vinyl chloride, Toluene, and cis-1,2-Dichloroethene in sample		108-S01-007DL1*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Sample 108-S05-005, 108-S05-005DL*, 108-S01-007*, 108-S01-007DL1*, 108-S01-007DL2*, 108-S02-013*, and 108-S02-013DL**

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles with the exceptions listed below.

B. Due to grossly exceeded holding times, the following detected results are estimated and the nondetected results are rejected (Jh/Rh).

- All semivolatile compounds in sample 108S02-008RE 108-S02-013RE*

The extraction holding time of 7 days for waters was exceeded by 21 days in samples 108S02-008RE 108-S02-013RE*

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following detected results are estimated and the nondetected results are rejected (Ja/Ra).

- All semivolatile compounds in sample 108-S02-008

- Bis(2-chloroethyl) ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, Hexachloroethane, Nitrobenzene, Isophorone, Bis(2-chloroethoxy)methane, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, Hexachlorocyclopentadiene, 2-Chloronaphthalene, 2-Nitroaniline, Dimethylphthalate, Acenaphthylene, 2,6-Dinitrotoluene, 3-Nitroaniline, Acenaphthene, Dibenzofuran, 2,4-Dinitrotoluene, Diethylphthalate, 4-Chlorophenylphenyl ether, Fluorene, 4-Nitroaniline, N-Nitrosodiphenylamine, 4-Bromophenyphenyl ether, Hexachlorobenzene, Phenanthrene, Anthracene, Carbazole, Di-n-butylphthalate, Fluoranthene, Pyrene, Butylbenzylphthalate, 3,3'-Dichlorobenzidine, Benzo(a)anthracene, Chrysene, Bis(2-ethyhexyl)phthalate, Di-n-octylphthalate, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene in samples 108-S02-013* 108-S02-013RE*

Surrogate recoveries were within CLP limits with the following exceptions:

Sample ID	Surrogate	% R	QC Limits
108-S02-008	Nitrobenzene-d5	5	35-114
108-S02-008	2-Fluorobiphenyl	8	43-116
108-S02-008	Terphenyl-d14	3	33-141
108-S02-008	Phenol-d5	6	10-110
108-S02-008	2-Fluorophenol	4	21-110
108-S02-008	2,4,6-Tribromophenol	10	10-123
108-S02-008	2-Chlorophenol-d4	7	33-110

108-S02-008	1,2-Dichlorobenzene-d4	6	16-110
108-S02-013*	Terphenyl-d14	7	33-141
108-S02-013RE*	Terphenyl-d14	9	33-141

Surrogate recoveries <10% show a severe analytical deficiency. Detected results may be biased low and false nondetects may have been reported.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. All percent recoveries (%R) and relative percent differences (RPD) were within CLP limits.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. The results obtained in the analysis of the LCS not within the control limits are shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKDUBS/D	4-Nitrophenol	92	88	10-80	-	-
SBLKDUBS/D	Pentachlorophenol	107	-	9-103	-	-

Although the above listed recoveries demonstrate a high bias, the associated samples results were nondetected and therefore were not qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Diethylphthalate in sample 108-S01-007*
- Bis(2-ethylhexyl)phthalate in samples 108-S01-007* 108-S02-008RE 108-S02-013*

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. Due to method blank contamination, the following results are considered nondetected (UJb).

- Unknown (25.65) and Unknown (28.50) in sample 108-S02-013*

The following compounds were detected in the associated method blanks at the concentrations noted below.

Compound	Blank ID	Concentration, µg/L
Unknown (25.63)	SBLKBN	8
Unknown (28.16)	SBLKBN	2

Detected results less than 10x the blank contamination were qualified.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- 3-Nitroaniline in samples 108-S02-008RE 108-S02-013RE*

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/25/97	3-Nitroaniline	32.3

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

- 2,4-Dinitrophenol, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene in samples 108-S01-007* 108-S02-008 108-S02-013*
- 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitroaniline, and Benzo(k)fluoranthene in sample 108-S01-007DL*
- 3-Nitroaniline, 4-Nitrophenol, and Di-n-octylphthalate in sample 108-S02-013RE*
- 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, 3-Nitroaniline, 2,4-Dinitrophenol, and 4,6-Dinitro-2-mehtylphenol in sample 108-S02-008RE

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/18/97	2,4-Dinitrophenol	35.1
11/18/97	Benzo(k)fluoranthene	38.8
11/18/97	Dibenz(a,h)anthracene	34.9
11/18/97	Benzo(g,h,i)perylene	36.1

11/19/97	4-Chloroaniline	50.1
11/19/97	3-Nitroaniline	52.4
11/19/97	2,4-Dinitrophenol	31.2
11/19/97	4-Nitroaniline	27.3
11/19/97	Benzo(k)fluoranthene	39.1
12/4/97	3-Nitroaniline	29.4
12/4/97	4-Nitrophenol	27.2
12/4/97	Di-n-octylphthalate	34.1
12/5/97	2,2'-Oxybis(1-chloropropane)	77.5
12/5/97	N-Nitroso-di-n-propylamine	25.3
12/5/97	3-Nitroaniline	44.3
12/5/97	2,4-Dinitrophenol	42.0
12/5/97	4,6-Dinitro-2-methylphenol	34.4

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. No field duplicates were identified in this SDG.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

Detected results reported below the CRQL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

B. The following detected results are qualified as estimated (Jh).

- 2,4-Dimethylphenol in sample 108-S01-007*

The above listed sample results exceeded the calibration range.

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in samples 108-S01-007*, 108-S01-007DL*, 108-S02-013*, and 108-S02-013RE*.

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in samples 108-S01-007*, 108-S01-007DL*, 108-S02-013*, and 108-S02-013RE*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP PESTICIDE/PCB ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for pesticide/PCBs.

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

- All pesticide/PCB compounds in sample 108-S02-013*

Surrogate recoveries were within the 30-150% CLP limits with the following exceptions:

Sample ID	Surrogate	Col.1 % R	Col.2 % R	QC Limits
108-S02-013*	Decachlorobiphenyl	15	20	30-150

Low recoveries indicate that detected and nondetected results may be biased low.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Decachlorobiphenyl in sample 108-S02-013*, were acceptable and therefore no data required qualification. The Decachlorobiphenyl percent recovery demonstrated a low bias and all of the associated sample results were qualified as estimated.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits.

V. Blank Contamination

A. No pesticide or PCB contaminants were found in the method blanks.

VI. Calibrations

A. A Resolution check mixture was analyzed at the beginning of the initial calibration sequence on each GC column. The resolution between adjacent peaks of target compounds was greater

than or equal to 60% as required in the CLP SOW.

B. Performance evaluation mixtures (PEM) were analyzed at the proper frequency. The resolution between adjacent peaks was 90% on both GC columns. The absolute retention times for the initial and continuing PEMs were within the calculated retention time windows based on the three-point initial calibration.

C. The individual 4,4'-DDT and Endrin breakdowns were less than or equal to 20.0% and the combined breakdowns were less than or equal to 30.0% as required in the CLP SOW.

D. The relative percent differences (RPD) of amounts of each compound in PEMs were within the 25.0% CLP limits.

E. The initial calibration sequence was followed as required in the CLP SOW. Initial calibration of single and multicomponent compounds was performed for both columns at proper frequencies. The retention time windows were established according to the CLP SOW.

F. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- Heptachlor and 4,4'-DDE in sample 108-S02-013*

The percent relative standard deviations (%RSD) of calibration factors for single component compounds were within the 20.0% CLP limits with the following exceptions:

Calibration Date	Compound	%RSD
11/11/97	Heptachlor	24.13
11/11/97	4,4'-DDE	21.22

The retention time windows were established according to the CLP SOW.

All required peaks for multicomponent compounds were present.

G. Continuing calibration sequence was followed as required in the CLP SOW. No more than 12 hours elapsed between continuing calibration analyses in an analytical sequence . The retention times (RT) of all compounds in Individual Mix and multicomponent standards were within CLP limits. The relative percent differences (RPD) of amount in Individual Mix standards were within the 25.0% CLP limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

*Full Validation Criteria for Sample 108-S02-013**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. There were no confirmation problems.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S05-011	108-S05-005*	108-S02-008	108-S21-001
	108-S05-007	108-S10-001	108-S02-013*	108-S11-003
	108-S05-006	108-S01-007*	108-S11-002	108-S11-004
	108-S05-016	108-S01-008	108-S11-001	108-S11-005
	108-S05-015	108-S06-001		
• Antimony in samples	108-S05-011	108-S01-008	108-S02-013*	108-S21-001
	108-S05-007	108-S06-001	108-S11-002	108-S11-004
	108-S05-016			
• Arsenic in samples	108-S05-011	108-S06-001	108-S11-002	108-S11-004
	108-S05-006	108-S02-008	108-S11-003	108-S11-005
	108-S05-015			
• Cadmium in samples	108-S05-011	108-S05-005*	108-S06-001	108-S11-003
	108-S05-007	108-S01-007*	108-S02-013*	108-S11-004
	108-S05-015	108-S01-008	108-S11-001	
• Chromium in samples	108-S05-011	108-S05-005*	108-S06-001	108-S11-003
	108-S05-007	108-S10-001	108-S11-001	108-S11-004
	108-S05-006	108-S01-007*	108-S21-001	108-S11-005
	108-S05-015	108-S01-008		
• Iron in samples	108-S10-001	108-S11-004		

• Lead in samples	108-S11-004	108-S11-005		
• Nickel in sample	108-S11-001			
• Silver in samples	108-S02-008	108-S11-002	108-S21-001	108-S11-004
	108-S02-013*	108-S11-001	108-S11-003	108-S11-005
• Vanadium in samples	108-S05-011	108-S05-015	108-S02-008	108-S11-004
	108-S05-006	108-S01-008	108-S11-001	108-S11-005
	108-S05-016	108-S06-001	108-S11-003	
• Zinc in samples	108-S05-007	108-S05-005*	108-S06-001	108-S21-001
	108-S05-006	108-S10-001	108-S11-002	108-S11-003
	108-S05-015	108-S01-007*	108-S11-001	
• Molybdenum in samples	108-S05-011	108-S01-007*	108-S02-013*	108-S11-004
	108-S05-006	108-S01-008	108-S11-002	108-S11-005
	108-S05-015	108-S02-008	108-S11-003	

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	PB	27.40
Aluminum	CCB	66.6
Antimony	PB	0.77
Antimony	CCB	9.0
Arsenic	CCB	2.4
Cadmium	CCB	0.3
Calcium	PB	35.24
Calcium	CCB	45.9
Chromium	PB	0.48
Chromium	CCB	1.0
Iron	CCB	27.6
Lead	CCB	2.4
Magnesium	PB	8.78
Magnesium	CCB	34.0
Manganese	CCB	1.3
Nickel	CCB	-0.7
Potassium	PB	67.18
Potassium	CCB	135.3
Silver	CCB	0.9
Sodium	CCB	-271.7
Thallium	CCB	-1.4
Vanadium	CCB	1.3
Zinc	CCB	2.04
Molybdenum	PB	0.32
Molybdenum	CCB	1.2

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

• Selenium in samples	108-S02-013*	108-S11-001	108-S11-004
	108-S11-002		

The recoveries that did not meet the CLP limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S21-001MS	Selenium	127.6	75-125

Spike recoveries above 125% indicate that detected results may be biased high.
All other associated sample results were nondetected and therefore were not qualified.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤10.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. Due to ICP serial dilution problems, the following detected results are qualified as estimated (Jh).

• Potassium and Sodium in samples	108-S05-011	108-S10-001	108-S11-002
	108-S05-007	108-S01-007*	108-S11-001
	108-S05-006	108-S01-008	108-S21-001
	108-S05-016	108-S06-001	108-S11-003
	108-S05-015	108-S02-008	108-S11-004
	108-S05-005*	108-S02-013*	108-S11-005

The percent difference between the original sample result and the serial dilution result was outside the QC limits of 10% for analyte concentrations greater than 50x the IDL as shown below.

Sample ID	Analyte	Original Concentration	50x IDL	%D
108-S10-007*	Potassium	56406.56	1190.0	20.8
108-S10-007*	Sodium	134647.46	9500	13.1
108-S01-008	Potassium	22413.28	1190.0	16.6
108-S21-001	Potassium	92148.00	1190.0	19.1

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S11-004/108-S11-005:

- 29% for Aluminum
- 200% for Antimony
- 200% for Cobalt
- 200% for Copper
- 149% for Iron
- 200% for Selenium
- 32% for Vanadium
- 44% for Zinc

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-S05-005*, 108-S01-007*, and 108-S02-013*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Due to analytical spike percent recovery problems, the following nondetected results are qualified as estimated (UJh).

- Thallium in sample 108-S02-013*

The analytical spike recovery results did not meet the 85-115% recovery criteria for accuracy. The percent recovery for each analyte is presented below.

Sample	Analyte	%Recovery
108-S02-013*	Thallium	70.8

The analytical spike recovery results in the samples listed above show an analytical deficiency. Low analytical spike results indicate a low bias in detected results or possible false nondetects in nondetected results.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL with the exceptions listed below.

B. Due to spectral interferences, the following detected and nondetected results are qualified as estimated (Jh/UJh).

- Antimony, Cadmium, Chromium, Cobalt, Lead, and Silver in sample 108-S02-013*

Positive and/or negative results greater than the IDL for analytes that should not be present were detected in the ICSA solution. Further evaluation of the sample indicates that spectral interferences may exist due to a high concentration of Magnesium in the samples.

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met for TPHG.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate percent recoveries (%R) were within the 75-125% QC limits and the relative percent differences (RPD) were ≤30 .

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks and no field blanks were identified for TPHG analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

*Full Validation Criteria for Sample 108-S01-007**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. There were no confirmation problems.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for unpreserved waters were met for TPHE.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate percent recoveries (%R) were within the 50-150% QC limits and the relative percent differences (RPD) were ≤50 .

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected results are qualified as estimated (Jh).

- Diesel range organics in sample 108-S01-007*

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Compound	LCS % R	LCSD % R	QC Limits	RPD	QC Limits
PBLKIOBS/D	Diesel range organics	40	41	60-140	-	≤50

Detected results for Diesel range organics may be biased low and false nondetects may have been reported.

V. Blank Contamination

A. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks and no field blanks were identified for TPHE analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

*Full Validation Criteria for Sample 108-S01-007**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. There were no confirmation problems.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total dissolved solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, Nitrite, and Total organic carbon..

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, Fluoride and Total organic carbon, 14 day analysis holding time requirements for Alkalinity, 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method. All Initial and Continuing calibration verification frequency and percent recoveries (%R) were within the 90-110% QC limits.

B. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. Due to method blank contamination, the following results are considered nondetected (UJb).

- Total organic carbon in sample 108-S21-001

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, mg/L
Total organic carbon	MB	1.1

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

V. Matrix Duplicate

A. Matrix duplicate (DUP) analyses were reviewed for each matrix as applicable. All other relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses following exceptions:

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits and the relative percent differences (RPD) were within the laboratory established QC limits.

VII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S11-004/108-S11-005:

- 30% for Chloride
- 26% for Phosphate

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S05-005*, 108-S01-007*, and 108-S02-013*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were <u>not</u> consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP-pesticide/PCB analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except for Decachlorobiphenyl in sample 108-S02-013*, were acceptable and therefore no data required qualification. The Decachlorobiphenyl percent recovery demonstrated a low bias and all of the associated sample results were qualified as estimated.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the technical holding time exceedance and initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound nondetected results were rejected in samples 108-S05-015DL, 108-S05-005DL*, 108-S00-004RE, 108-S01-007DL2*, and 108-S02-008DL.

- Due to low RRFs in the initial calibration, Acetone and 2-Butanone nondetected results were rejected in samples 108-S01-007DL2*, 108-S02-008DL, 108-S00-004RE, 108-S05-015DL, 108-S05-005DL*, 108-S05-011, 108-S05-011RE, 108-S05-007, 108-S05-007DL, 108-S05-006, 108-S05-016, 108-S05-015, 108-S05-005*, 108-S10-001, 108-S00-004, 108-S01-007*, 108-S01-008, 108-S06-001, 108-S02-008, and 108-S02-013*, Acetone nondetected results were rejected in samples 108-S11-002, 108-S11-001, 108-S21-001, 108-S11-003, 108-S11-004, 108-S11-005, and 108-S11-005RE, and 2-Butanone nondetected results were rejected in samples 108-S01-007DL1*, 108-S06-001DL, 108-S02-013DL*, and 108-S11-004RE.

- Due to low RRFs in the continuing calibration, Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in samples 108-S00-004RE, 108-S01-007DL2*,

108-S02-008DL, 108-S01-007DL1*, 108-S06-001DL, 108-S02-013*, and 108-S11-004RE, Acetone and 2-Butanone nondetected results were rejected in samples 108-S05-007, 108-S05-006, 108-S05-016, 108-S05-015, 108-S05-005*, 108-S10-001, 108-S01-008, 108-S05-001, 108-S05-011RE, 108-S00-004, 108-D01-007*, 108-S06-001, 108-S02-008, 108-S02-008DL, 108-S05-007DL, 108-S05-005DL*, and 108-S05-015DL, and Acetone nondetected results were rejected in samples 108-S11-002, 108-S11-001, 108-S21-001, 108-S11-003, 108-S11-004, 108-S11-005, and 108-S11-005RE.

B. Due to technical holding time, instrument calibration, surrogate recovery, common laboratory and trip blank contamination, internal standard, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound results are qualified as estimated in six samples and all volatile compound detected results were qualified as estimated in five samples.
- Due to initial calibration %RSD problems, Bromomethane and 2-Hexanone results were qualified as estimated in seven samples and 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone results were qualified as estimated in four samples.
- Due to initial calibration RRF problems, Acetone and 2-Butanone detected results were qualified as estimated in fifteen samples and Acetone detected results were qualified as estimated in seven samples.
- Due to continuing calibration %D problems, Bromomethane results were qualified as estimated in fourteen samples and Bromomethane and 2-Heaxnone results were qualified as estimated in four samples.
- Due to continuing calibration RRF problems, Acetone and 2-Butanone detected results were qualified as estimated in eight samples and Acetone detected results were qualified as estimated in seven samples.
- Due to common laboratory contamination problems, Acetone was qualified nondetect in two samples.
- Due to trip blank contamination problems, cis-1,2-Dichloroethene was qualified nondetect in thirteen samples.
- Due to surrogate recovery problems, all volatile compound results were qualified as estimated in two samples.
- Due to internal standard problems, Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene results were qualified as estimated in one sample.
- Due to compound quantitation problems, Vinyl chloride and cis-1,2-Dichloroethene detected results were qualified as estimated in four samples, 1,1-Dichloroethene, Benzene, and Ethylbenzene detected results were qualified as estimated in one sample, and Xylenes (total), Toluene, and Chlorobenzene detected results were qualified as estimated in two samples.
- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S05-011 was reanalyzed due to surrogate and internal standard results exceeding the acceptance criteria, 108-S00-004 was reanalyzed due to carry over contamination, samples 108-S11-004 and 108-S11-005 were reanalyzed due to surrogate results exceeding acceptance criteria, and samples 108-S05-007, 108-S05-015, 108-S05-005*, 108-S01-007*, 108-S06-001, 108-S02-008, and 108-S02-013* were diluted due to sample results exceeding the calibration range. For sample 108-S05-007 all results except Vinyl chloride should be considered the most usable. The Vinyl chloride result for sample 108-S05-007DL should be considered the most usable. For sample 108-S05-015 all results except Vinyl chloride, 1,1-Dichloroethane, and cis-1,2-Dichloroethene should be considered the most usable. The Vinyl chloride, 1,1-Dichloroethane, and cis-1,2-Dichloroethene results for sample 108-S05-015DL should be considered the most usable. For sample 108-S05-005* all results except Xylenes (total) should be considered the most usable. The Xylenes (total) result for sample 108-S05-005DL* should be considered the most usable. For sample 108-S01-007* all results except Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylenes (total), and cis-1,2-Dichloroethene should be considered the most usable. The Benzene, Chlorobenzene, Ethylbenzene, and Xylenes (total) results for sample 108-S01-007DL1* and the Vinyl chloride, Toluene, and cis-1,2-Dichloroethene results for sample 108S01-007DL2* should be considered the most usable. For sample 108-S06-001 all results except cis-1,2-Dichloroethene should be considered the most usable. The cis-1,2-Dichloroethene result for sample 108-S06-001DL should be considered the most usable. For samples 108-S02-008 and 108-S02-013* all results except Chlorobenzene should be considered the most usable. The Chlorobenzene results for samples 108-S02-008DL and 108-S02-013DL* should be considered the most usable. The reanalyses of sample 108-S05-011RE had more acceptable surrogate recoveries and internal standard results and should be considered the most usable. The original sample analysis 108-S00-004, was contaminated therefore the reanalysis results, 108-S00-004RE, should be considered the most usable. The reanalysis samples 108-S11-004RE and 108-S11-005RE were outside of the technical holding time and therefore the original results, 108-S11-004 and 108-S11-005, should be considered the most usable.

CLP Semivolatile Organic Analysis

A. Due to severe problems in the technical holding time exceedance and low surrogate recoveries in the semivolatile analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, all semivolatile compound nondetected results were rejected in samples 108-S02-008RE and 108-S02-0013RE*.

- Due to low surrogate recovery, all semivolatile compound nondetected results were rejected in sample 108-S02-008 and Bis(2-chloroethyl) ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, Hexachloroethane, Nitrobenzene, Isophorone, Bis(2-chloroethoxy)methane, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, Hexachlorocyclopentadiene, 2-Chloronaphthalene, 2-Nitroaniline, Dimethylphthalate, Acenaphthylene, 2,6-Dinitrotoluene, 3-Nitroaniline, Acenaphthene, Dibenzofuran, 2,4-Dinitrotoluene, Diethylphthalate, 4-Chlorophenylphenyl ether, Fluorene, 4-Nitroaniline, N-Nitrosodiphenylamine, 4-Bromophenyphenyl ether, Hexachlorobenzene, Phenanthrene, Anthracene, Carbazole, Di-n-butylphthalate, Fluoranthene, Pyrene, Butylbenzylphthalate, 3,3'-Dichlorobenzidine, Benzo(a)anthracene, Chrysene, Bis(2-ethyhexyl)phthalate, Di-n-octylphthalate,

Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene nondetected results were rejected in two samples.

B. Due to technical holding time, instrument calibration, common laboratory and method blank contamination, surrogate recovery, and compound quantitation problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all semivolatile compound detected results were qualified as estimated in two samples.
- Due to initial calibration %RSD problems, 3-Nitroaniline results were qualified as estimated in two samples.
- Due to continuing calibration %D problems, 2,4-Dinitrophenol, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene results were qualified as estimated in three samples and 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitroaniline, and Benzo(k)fluoranthene, 4-Nitrophenol, and Di-n-octylphtalate, 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, and 4,6-Dinitro-2-mehtylphenol results were qualified as estimated in one sample.
- Due to common laboratory contamination problems, Diethylphthalate was qualified nondetect in one sample and Bis(2-ethylhexyl)phthalate was qualified nondetect in three samples.
- Due to method blank contamination problems, Unknown (25.65) and Unknown (28.50) were qualified nondetect in one sample.
- Due to low surrogate recovery, Bis(2-chloroethyl) ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, Hexachloroethane, Nitrobenzene, Isophorone, Bis(2-chloroethoxy)methane, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, Hexachlorocyclopentadiene, 2-Chloronaphthalene, 2-Nitroaniline, Dimethylphthalate, Acenaphthylene, 2,6-Dinitrotoluene, 3-Nitroaniline, Acenaphthene, Dibenzofuran, 2,4-Dinitrotoluene, Diethylphthalate, 4-Chlorophenylphenyl ether, Fluorene, 4-Nitroaniline, N-Nitrosodiphenylamine, 4-Bromophenyphenyl ether, Hexachlorobenzene, Phenanthrene, Anthracene, Carbazole, Di-n-butylphthalate, Fluoranthene, Pyrene, Butylbenzylphthalate, 3,3'-Dichlorobenzidine, Benzo(a)anthracene, Chrysene, Bis(2-ethyhexyl)phthalate, Di-n-octylphthalate, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene detected results were qualified as estimated in two samples.
- Due to compound quantitation problems, 2,4-Dimethylphenol was qualified as estimated in one sample.
- All tentatively identified compounds were qualified (NJ).
- All CLP SVOA detected results reported below the CRQL.

C. Sample 108-S01-007* was diluted due to sample results exceeding the calibration range and samples 108-S02-008 and 108-S02-013* were reextracted due to low surrogate recoveries. For sample 108-S01-007*, all results except 2,4-Dimethylphenol should be considered the most usable. The 2,4-Dimethylphenol results for sample 108-S01-007DL* should be considered the most usable. The original analysis of sample 108-S02-008 had severely low percent recoveries for all eight surrogates and therefore the results for sample 108-S02-008RE should be considered the most usable. Both the original and reanalysis of sample 108-S02-013* had low percent recovery for one surrogate and the reanalysis exceeded holding time criteria, therefore the original analysis should be considered the most usable.

Pesticide/PCB Analysis

A. No results for pesticide/PCB analysis were rejected in this SDG.

B. Due to instrument calibration and surrogate recovery problems in the pesticide/PCB analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, Heptachlor and 4,4'-DDE results were qualified as estimated in one sample.
- Due to low surrogate recoveries, all pesticide/PCB results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for CLP pesticide/PCB analysis in this SDG.

CLP Metals Analysis

A. No results for metals analysis were rejected in this SDG.

B. Due to calibration blank and method blank contamination, MS, graphite furnace atomic absorption QC, ICP serial dilution, and ICP interference check sample problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum was qualified nondetect in eighteen samples, Antimony and Arsenic were qualified nondetect in nine samples, Cadmium, Vanadium, Zinc, and Molybdenum were qualified nondetect in eleven samples, Chromium was qualified as nondetect in fourteen samples, Iron and Lead were qualified nondetect in two samples, Nickel was qualified nondetect in one sample, and Silver was qualified nondetect in eight samples.
- Due to MS recovery problems, Selenium detected results were qualified as estimated in four samples.
- Due to low percent recovery in the GFAA QC, Thallium was qualified as estimated in one sample.
- Due to precision problems in the ICP serial dilution, Potassium and Sodium were qualified as estimated in eighteen samples.
- Due to ICP interference check sample problems, Antimony, Cadmium, Chromium, Cobalt, Lead, and Silver were qualified as estimated in one sample.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to LCS problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:

- Due to LCS recovery problems, Diesel range organics results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for TPH extractable analysis in this SDG.

Non-CLP Inorganic and Physical Analysis

A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.

B. Due to method blank contamination problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to method blank contamination, Total organic carbon was qualified nondetect in one sample.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW04

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: February 25, 1999

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Pesticide/PCBs, TPH Gasoline, TPH Extractables, and Non-CLP Inorganic and Physical Analysis

The wrong contract task order (CTO) number (No.) was referenced on page 1 of the data validation report. The CTO No. should be 069-108B01 not 069-109B01.

CLP Volatiles

1. Holding times: Only the detected target compounds benzene, toluene, ethylbenzene, and xylene (total) in samples 108-S07-004DL and 108-S07-005DL were qualified as estimated.

2. Calibrations: Due to relative response factor (RRF) problems, detected results for acetone in samples 108-S07-001 and 108-SBG-003 were qualified as estimated. Acetone results in the other listed samples were rejected.

CLP Semivolatiles

1. Blank contamination: Results for bis(2-ethylhexyl)phthalate in samples 108-SBG-001 and 108-SBG-002 in addition to the other listed samples were qualified as nondetected. Phthalates are considered common laboratory contaminants when found at levels less than 10 times than the contract-required quantitation limit (CRQL).

2. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in the full validation samples.

3. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The samples were found to be correctly quantitated.

CLP Pesticide/PCB

1. Pesticide cleanup checks: Florisil checks were performed and all recoveries were within specified QC limits.

2. TCL identification: No pesticide/PCB compounds were detected in the full validation sample.

3. Compound quantitation: No pesticide/PCB compounds were detected in the full validation sample. The reported detection limits were consistent with Tetra Tech EMI's required reporting limits and reflect any dilutions and volumes.

TPH Gasoline

1. TCL Identification: The target compound gasoline range organics was identified correctly in full validation sample 108-SBG-001. No gasoline was detected in full validation sample 108-S13-001. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected gasoline range organic results in samples 108-S07-004, 108-S07-005, 108-SBG-001, and 108-SBG-003 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the gasoline standard used for calibration.

TPH Extractable Analysis

1. TCL Identification: The target compound motor oil range organics was identified correctly in full validation sample 108-S13-001. No target compounds were detected in sample 108-SBG-001. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected diesel range organic results in samples 108-S07-004, 108-S07-005, 108-S13-002, and 108-SBG-002 and motor oil range organic results in samples 108-S07-005, 108-S07-006, 108-S13-001, and 108-S13-002 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the diesel and motor oil standards used for calibration.

Non-CLP Inorganic and Physical Analysis

1. Blank Contamination: No qualifications were performed based on field and equipment rinsate blanks because low-level concentration of nitrate in samples 108-S09-001 and 108-S12-001 were previously qualified due to method blank contamination.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, Pei Jing, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2556B
Review Date:	December 30, 1997 through January 5, 1998
Sample Delivery Group (SDG) No.:	AAW04

Sample Nos.:

108-S00-005	108-S09-001	108-S00-006	108-S09-001DUP
108-S07-003	108-S09-002	108-S00-006RE	108-S07-006MS
108-S07-003RE	108-S07-001	108-S12-001	108-S07-006MSD
108-S07-004	108-S07-006	108-S12-001RE	108-S13-001MS
108-S07-004DL	108-S07-006RE	108-S02-003	108-S13-001MSD
108-S07-005	108-S13-001*	108-S02-003RE	108-S13-001DUP
108-S07-005DL	108-S13-002	108-S07-003MS	108-S13-002MS
108-SBG-003	108-SBG-100	108-S07-003MSD	108-S13-002MSD
108-SBG-001*	108-S99-001	108-SBG-001MS	108-S99-001MS
108-SBG-002	108-S99-001RE	108-SBG-001DUP	108-S99-001DUP
108-SBG-004	108-S99-002	108-S09-001MS	

* Full Validation Sample

Matrix:	Water
Collection Date(s):	November 5 through November 6, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

* Holding times
  GC/MS instrument performance check
* Initial and continuing calibrations
* Blanks
* Surrogate recovery
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits
  System performance
* Overall assessment of data for the SDG

CLP Inorganic Parameters

* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
  ICP interference check sample
  GFAA quality control
* ICP serial dilution
  Sample result verification
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

* Method compliance
* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
* Surrogate recovery
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

LE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 7-8	pg. 8	N/A	pg. 9	pg. 9	pg. 10-12	pg. 12	pg. 12-13	pg. 13
SVOA	√	√	pg. 15	N/A	√	pg. 15-16	pg. 16-17	√	N/A	pg. 17
Pesticide/PCB	√	pg. 19	pg. 19	N/A	√	√	pg. 19-20	N/A	N/A	√
Metals	√	N/A	√	√	√	pg. 22-24	√	N/A	pg. 24-25	pg. 25
TPHG	√	pg. 27	√	√	√	√	√	N/A	pg. 28	√
TPHE	√	pg. 29	pg. 29	√	pg. 29-30	√	√	N/A	pg. 30	√
Alkalinity	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfide	√	N/A	√	√	√	√	√	N/A	N/A	√
TOC	√	N/A	√	√	√	pg. 32-33	√	N/A	N/A	√
TDS	pg. 32	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	√	√	√	√	√	N/A	N/A	√
Chloride	√	N/A	√	√	√	√	√	N/A	N/A	√
Fluoride	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfate	√	N/A	√	√	√	√	√	N/A	N/A	√
Phosphate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-SBG-001* and 108-S13-001*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 13-14	√	N/A	N/A
SVOA	√	√	√	√	pg. 18	√	N/A	N/A
Pesticide/PCB	N/A	√	√	√	N/A	√	N/A	N/A
Metals	N/A	√	√	√	N/A	N/A	√	pg. 25
TPHG	N/A	√	√	√	N/A	N/A	N/A	N/A
TPHE	N/A	√	√	pg. 31	N/A	N/A	N/A	N/A
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 33-34	N/A	N/A	N/A	N/A
TOC	N/A	√	√	√	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to grossly exceeded holding times, the following detected results are estimated and the nondetected results are rejected (Jh/Rh).

• All volatile compounds in samples	108-S07-003RE 108-S07-004DL	108-S07-005DL	108-S02-003RE

The analysis holding time of 7 days for unpreserved waters was exceeded by 11 days in sample	108-S07-003RE
The analysis holding time of 14 days for preserved waters was exceeded by 23 days in sample	108-S07-004DL
The analysis holding time of 14 days for preserved waters was exceeded by 21 days in sample	108-S07-005DL
The analysis holding time of 14 days for preserved waters was exceeded by 20 days in sample	108-S02-003RE

B. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• All volatile compounds in samples	108-S07-001 108-S99-001RE	108-S00-006RE	108-S12-001RE

The analysis holding time of 7 days for unpreserved waters was exceeded by 7 days in sample	108-S07-001
The analysis holding time of 14 days for preserved waters was exceeded by 1 day in samples	108-S99-001RE 108-S00-006RE 108-S12-001RE

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

• All volatile compounds in sample	108-S07-006RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S07-006RE	Bromofluorobenzene	78	80-120

Low recoveries indicate that detected and nondetected results may be biased low.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in samples 108-S12-001 108-S12-001RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S12-001	1,2-Dichloroethane-d4	131	80-120
108-S12-001RE	1,2-Dichloroethane-d4	125	80-120

High percent recoveries indicate that detected results may be biased high.

C. The other surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S07-006	1,2-Dichloroethane-d4	145	80-120
108-S07-006	Toluene-d8	128	80-120
108-S07-003	1,2-Dichloroethane-d4	121	80-120
108-S00-006	Toluene-d8	149	80-120
108-S99-001	1,2-Dichloroethane-d4	126	80-120
108-S99-001	Toluene-d8	131	80-120
108-S02-003	1,2-Dichloroethane-d4	138	80-120
108-S00-006RE	1,2-Dichloroethane-d4	130	80-120

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except in two samples, were acceptable and therefore no data required qualification. The Toluene-d8 and 1,2-Dichloroethane-d4 surrogate recoveries in sample 108-S07-006 demonstrated a high bias and the associated sample detected results were qualified as estimated based on these surrogate recoveries. The Bromofluorobenzene surrogate recovery in sample 108-S07-006RE demonstrated a low bias and the associated sample results were qualified as estimated based on this surrogate recovery. The 1,2-Dichloroethane-d4 surrogate recoveries in samples 108-S12-001 and 108-S12-001RE demonstrated a high bias and the associated sample detected results were qualified as estimated based on these surrogate recoveries

IV. Blank Spike or Laboratory Control Sample (LCS)

A. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits with the exceptions listed below.

B. The other %Rs outside of the QC Limits are listed below.

LCS ID	Compound	LCS %R	LCSD %R	QC Limits
VBLKNPBS/BSD	Acetone	-	211	0-200
VBLKNIBS/BSD	Acetone	-	206	0-200

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

C. The other RPDs outside of the QC Limits are listed below.

LCS ID	Compound	RPD	QC Limits
VBLKOGBS/BSD	Bromomethane	55	≤40
VBLKOMBS/BSD	Bromomethane	69	≤40
VBLKNSBS/BSD	Bromomethane	65	≤40
VBLKNSBS/BSD	Acetone	44	≤40
VBLKNSBS/BSD	2-Hexanone	45	≤40
VBLKGPBS/BSD	Bromomethane	114	≤40
VBLKGPBS/BSD	Chloroethane	77	≤40
VBLKGPBS/BSD	1,1-Dichloroethene	67	≤40
VBLKGPBS/BSD	Carbon disulfide	67	≤40
VBLKOPBS/BSD	Chloromethane	77	≤40
VBLKOPBS/BSD	2-Butanone	70	≤40
VBLKNPBS/BSD	Acetone	48	≤40
VBLKNPBS/BSD	cis-1,3-Dichloropropene	25	≤20

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Acetone in samples 108-SBG-003 108-S07-001

Acetone and Methylene chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks and no sample results were qualified based on trip blank contamination.

VI. Calibrations

A. Due to initial calibration problems, the following detected and nondetected results are qualified as estimated (Jf/UJf).

• Bromomethane and 2-Hexanone in samples	108-S07-001	108-SBG-100	108-S00-006RE
	108-S07-006	108-S99-001	108-S12-001
	108-S07-006RE	108-S99-001RE	108-S12-001RE
	108-S13-001*	108-S99-002	108-S02-003
	108-S13-002	108-S00-006	
• 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone in sample	108-S07-003RE		

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/19/97	Bromomethane	31.2
11/19/97	2-Hexanone	31.9
11/26/97	1,1-Dichloroethene	32.9
11/26/97	Acetone	52.9
11/26/97	Carbon disulfide	32.0
11/26/97	2-Hexanone	46.5

B. Due to initial calibration problems, the following detected results are qualified as estimated and nondetected results are rejected (Jf/Rf).

• Acetone and 2-Butanone in samples	108-S02-003RE	108-S07-003	108-SBG-001*
	108-S07-005DL	108-S07-004	108-SBG-004
	108-S07-004DL	108-S07-005	108-S09-001
	108-S00-005	108-SBG-003	108-S09-002
• Acetone in samples	108-S07-001	108-SBG-100	108-S00-006RE
	108-S07-006	108-S99-001	108-S12-001
	108-S07-006RE	108-S99-001RE	108-S12-001RE
	108-S13-001*	108-S99-002	108-S02-003
	108-S13-002	108-S00-006	
• 2-Butanone in sample	108-S07-003RE		

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
11/29/97	Acetone	0.013
11/29/97	2-Butanone	0.028
12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.028

11/12/97	Acetone	0.026
11/12/97	2-Butanone	0.044
11/19/97	Acetone	0.045
11/26/97	2-Butanone	0.040

C. Due to continuing calibration problems, the following detected and nondetected results are qualified as estimated (Jf/UJf).

• Bromomethane in samples	108-S00-005	108-S07-005	108-SBG-004
	108-S07-003	108-SBG-003	108-S09-001
	108-S07-004	108-SBG-001*	108-S09-002
• Bromomethane and 2-Hexanone in sample		108-S07-003RE	

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Calibration Date	Compound	%D
11/18/97	Bromomethane	38.0
11/30/97	Bromomethane	31.3
11/30/97	2-Hexanone	66.7

D. Due to continuing calibration problems, the following detected results were qualified as estimated and the nondetected results are rejected (Jf/Rf).

• Acetone, 2-Butanone, and 2-Hexanone in samples	108-S07-005DL	108-S02-003RE	108-S07-003RE
• Acetone and 2-Butanone in samples	108-S07-004DL	108-SBG-004	108-SBG-100
	108-S00-005	108-S09-001	108-S99-001
	108-S07-003	108-S09-002	108-S99-002
	108-S07-004	108-S07-006	108-S00-006
	108-S07-005	108-S13-001*	108-S12-001
	108-SBG-003	108-S13-002	108-S02-003
	108-SBG-001*		
• Acetone in samples	108-S07-001	108-S99-001RE	108-S12-001RE
	108-S07-006RE	108-S00-006RE	

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
12/9/97	Acetone	0.011
12/9/97	2-Butanone	0.020
12/9/97	2-Hexanone	0.049

12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.022
11/18/97	Acetone	0.030
11/18/97	2-Butanone	0.045
11/20/97 (VAB20)	Acetone	0.034
11/20/97 (VAB20)	2-Butanone	0.047
11/20/97 (VBB20)	Acetone	0.038
11/21/97	Acetone	0.038
11/30/97	Acetone	0.046
11/30/97	2-Butanone	0.030
11/30/97	2-Hexanone	0.046

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time with the exceptions listed below.

B. Due to internal standard problems, the following nondetected results are qualified as estimated (UJe).

- All volatile compounds in sample — 108-S07-006
- Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene in samples — 108-S00-006, 108-S12-001

The internal standard area counts in the samples listed above were less than one half of the reference standard and are listed below.

Sample	Internal Standard	Area	QC Limits
108-S07-006	1,4-Difluorobenzene	385673	388856-907330
108-S07-006	Chlorobenzene-d5	330939	340591-794711
108-S07-006	1,2-Dichlorobenzene-d4	124392	130191-303779
108-S00-006	1,2-Dichlorobenzene-d4	120146	130191-303779
108-S12-001	1,2-Dichlorobenzene-d4	129423	130191-303779

Internal standard area counts of less than 50% of the standard area count may indicate a loss of instrument sensitivity.

VIII. Field Duplicate

A. No RPDs were outside of the QC limits for field duplicate samples 108-S07-004/108-S07-005 and 108-S09-001/108-S09-002.

B. The following RPDs were obtained for the field duplicate samples 108-S07-004DL/108-S07-005DL:

- 56% for Benzene
- 54% for Toluene
- 56% for Ethylbenzene
- 55% for Xylenes (total)

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

- Benzene, Toluene, Ethylbenzene, and Xylenes (total) in samples 108-S07-004, 108-S07-005

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-SBG-001* and 108-S13-001*

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated with the exception of samples 108-S99-01RE, 108-S99-006RE, and 108-S12-001 for which the TIC Form Is were not provided by the laboratory due to file problems.

TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles.

II. Surrogate Recovery

A. Surrogate recoveries were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and therefore no data required qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Bis(2-ethylhexyl)phthalate in samples 108-SBG-003 108-S13-001* 108-S99-002 108-SBG-004 108-S99-001

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. Due to method blank contamination, the following results are considered nondetected (UJb).

- Unknown phthalate (24.90), Unknown phthalate (24.97), Unknown phthalate (25.06), Unknown phthalate (25.22) and Unknown phthalate (25.29) in sample 108-S99-001

The following compounds were detected in the associated method blanks at the concentrations noted below.

Compound	Blank ID	Concentration, µg/L
Unknown phthalate (26.18)	SBLKCH	9
Unknown phthalate (26.26)	SBLKCH	7
Unknown phthalate (26.34)	SBLKCH	3
Unknown phthalate (26.50)	SBLKCH	5
Unknown phthalate (26.58)	SBLKCH	4

Detected results less than 10x the blank contamination were qualified.

C. No sample results were qualified based on the field blank and rinsate blank contamination.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

• 3-Nitroaniline and 2,4-Dinitrophenol in samples	108-SBG-003 108-SBG-001* 108-SBG-002	108-SBG-004 108-S13-001*	108-S99-001 108-S99-002

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/7/97	3-Nitroaniline	34.8
11/7/97	2,4-Dinitrophenol	30.5

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, Benzo(b)fluoranthene in samples	108-SBG-004 108-S99-001 108-S99-002
• 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and 4,6-Dinitro-2-methylphenol in samples	108-SBG-003 108-SBG-001* 108-SBG-002 108-S13-001*

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/18/97	2,2'-Oxybis(1-chloropropane)	57.0

11/18/97	3-Nitroaniline	44.7
11/18/97	Benzo(b)fluoranthene	25.2
11/19/97	2,2'-Oxybis(1-chloropropane)	78.5
11/19/97	N-Nitroso-di-n-propylamine	25.6
11/19/97	4-Chloroaniline	30.9
11/19/97	3-Nitroaniline	55.3
11/19/97	2,4-Dinitrophenol	40.4
11/19/97	4-Nitrophenol	27.0
11/19/97	4-Nitroaniline	27.0
11/19/97	4,6-Dinitro-2-methylphenol	27.1

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. No field duplicates were identified in this SDG.

IX. Other Qualifications

A. A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

Detected results reported below the CRQL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-SBG-001* and 108-S13-001*

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in samples 108-SBG-001* and 108-S13-001*.

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in samples 108-SBG-001* and 108-S13-001*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP PESTICIDE/PCB ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for pesticide/PCBs.

II. Surrogate Recovery

A. Surrogate recoveries were within the 30-150% CLP limits with the following exceptions:

Sample ID	Surrogate	Col.1 % R	Col.2 % R	QC Limits
108-S99-001	Tetrachloro-m-xylene	165	-	30-150
108-S99-001	Decachlorobiphenyl	170	-	30-150

Although the above listed recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, with the exception of Tetrachloro-m-xylene and Decachlorobiphenyl in sample 108-S99-001, were acceptable and data did not require qualification. The Tetrachloro-m-xylene and Decachlorobiphenyl percent recovery demonstrated a high bias and the associated sample results were nondetected and therefore did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits.

V. Blank Contamination

A. No pesticide or PCB contaminants were found in the method blanks and field blanks.

VI. Calibrations

A. A Resolution check mixture was analyzed at the beginning of the initial calibration sequence on each GC column. The resolution between adjacent peaks of target compounds was greater than or equal to 60% as required in the CLP SOW.

B. Performance evaluation mixtures (PEM) were analyzed at the proper frequency. The resolution between adjacent peaks was 90% on both GC columns. The absolute retention times for the initial and continuing PEMs were within the calculated retention time windows based on the three-point initial calibration.

C. The individual 4,4'-DDT and Endrin breakdowns were less than or equal to 20.0% and the combined breakdowns were less than or equal to 30.0% as required in the CLP SOW.

D. The relative percent differences (RPD) of amounts of each compound in PEMs were within the 25.0% CLP limits.

E. The initial calibration sequence was followed as required in the CLP SOW. Initial calibration of single and multicomponent compounds was performed for both columns at proper frequencies. The retention time windows were established according to the CLP SOW.

F. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

• Heptachlor and 4,4'-DDE in samples	108-SBG-003	108-SBG-004	108-S99-001
	108-SBG-001*	108-SBG-100	108-S99-002
	108-SBG-002		

The percent relative standard deviations (%RSD) of calibration factors for single component compounds were within the 20.0% CLP limits with the following exceptions:

Calibration Date	Compound	%RSD
11/11/97	Heptachlor	24.13
11/11/97	4,4'-DDE	21.22

The retention time windows were established according to the CLP SOW.

All required peaks for multicomponent compounds were present.

G. Continuing calibration sequence was followed as required in the CLP SOW. No more than 12 hours elapsed between continuing calibration analyses in an analytical sequence . The retention times (RT) of all compounds in Individual Mix and multicomponent standards were within CLP limits. The relative percent differences (RPD) of amount in Individual Mix standards were within the 25.0% CLP limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for sample 108-SBG-003*.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S07-003 108-S07-004 108-S07-005	108-SBG-003 108-SBG-001* 108-SBG-004	108-S09-002 108-S07-001	108-S07-006 108-S02-003
• Antimony in samples	108-S07-004 108-S07-005	108-SBG-003 108-SBG-004	108-S09-001 108-S07-001	108-S12-001
• Barium, Calcium, Magnesium, Manganese, Potassium, and Sodium in samples			108-S99-001	108-S99-002
• Chromium in samples	108-S07-004 108-S07-005 108-SBG-002	108-SBG-004 108-S09-001	108-S09-002 108-S07-001	108-S13-002 108-S99-001
• Copper in samples	108-S13-002	108-S99-001	108-S02-003	
• Iron in sample	108-S99-002			
• Lead in sample	108-S13-002			

• Nickel in samples	108-S07-004	108-SBG-002	108-S09-002	108-S99-001
	108-S07-005	108-SBG-004	108-S13-001*	108-S12-001
	108-SBG-003	108-S09-001	108-S13-002	108-S02-003
	108-SBG-001*			
• Vanadium in samples	108-S07-004	108-SBG-004	108-S09-002	108-S12-001
	108-SBG-002	108-S09-001	108-S13-002	108-S02-003
• Zinc in samples	108-S07-004	108-SBG-002	108-S07-001	108-S99-001
	108-S07-005	108-SBG-004	108-S07-006	108-S99-002
	108-SBG-003	108-S09-001	108-S13-001*	108-S12-001
	108-SBG-001*	108-S09-002	108-S13-002	108-S02-003
• Molybdenum in samples	108-SBG-003	108-S09-001	108-S07-006	108-S12-001
	108-SBG-001*	108-S09-002	108-S13-001*	108-S02-003
	108-SBG-004			

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	CCB	57.0
Antimony	CCB	2.2
Barium	PB	0.28
Calcium	PB	67.34
Calcium	CCB	51.0
Chromium	PB	0.46
Copper	CCB	-2.1
Iron	PB	28.96
Iron	CCB	16.7
Lead	PB	1.16
Lead	CCB	1.4
Magnesium	PB	11.42
Magnesium	CCB	35.5
Manganese	PB	0.42
Manganese	CCB	1.0
Nickel	PB	1.99
Potassium	PB	61.94
Potassium	CCB	116.0
Sodium	CCB	-436.0
Thallium	CCB	-1.1
Vanadium	CCB	1.1
Zinc	PB	4.17
Molybdenum	CCB	1.2

Detected results less than 5x the maximum blank contamination were qualified.

B. Due to field and equipment rinsate blank contamination, the following results are considered nondetected (UJb).

• Cadmium in samples	108-S07-005	108-SBG-004	108-S09-002	108-S13-001*
	108-SBG-001*	108-S09-001	108-S07-006	108-S13-002
	108-SBG-002			

The following analytes were detected in the associated field blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Cadmium	108-S99-002	0.16

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Percent recoveries (%R) were within the 75-125% CLP limits.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤10.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. The percent difference between the original sample result and the serial dilution result was within the QC limits of 10% for analyte concentrations greater than 50x the IDL.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S07-004/108-S07-005:

- 43% for Aluminum
- 47% for Cadmium
- 50% for Chromium
- 200% for Cobalt
- 125% for Vanadium
- 37% for Zinc

The following RPDs were obtained for the field duplicate samples 108-S09-001/108-S09-002:

- 200% for Aluminum
- 200% for Antimony

- 67% for Cadmium
- 44% for Calcium
- 77% for Zinc
- 28% for Molybdenum

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-SBG-001* and 108-S13-001*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. Due to analytical spike percent recovery problems, the following nondetected results are qualified as estimated (UJh).

- Thallium in sample 108-SBG-001*

The analytical spike recovery results did not meet the 85-115% recovery criteria for accuracy. The percent recovery for each analyte is presented below.

Sample	Analyte	%Recovery
108-SBG-001*	Thallium	82.7

The analytical spike recovery results in the samples listed above show an analytical deficiency. Low analytical spike results indicate a low bias in detected results or possible false nondetects in nondetected results.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL .

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met for TPHG.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All TPHG compounds in sample 108-S07-005

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S07-005	4-Bromofluorobenzene	134	75-125%

High percent recoveries indicate that detected results may be biased high.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate percent recoveries (%R) were within the 75-125% QC limits and the relative percent differences (RPD) were ≤30 .

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks or field blanks.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or

equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S07-004/108-S07-005:

- 47% for TPH as gasoline

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-SBG-001* and 108-S13-001*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-SBG-001* and 108-S13-001*.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for unpreserved waters were met for TPHE.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

- All TPHE compounds in samples 108-S07-003 108-S07-003RE

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S07-003	2-Fluorobiphenyl	59	60-140%
108-S07-003	o-Terphenyl	53	60-140%
108-S07-003RE	2-Fluorobiphenyl	59	60-140%
108-S07-003RE	o-Terphenyl	52	60-140%

Low recoveries indicate that detected and nondetected results may be biased low.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed in this SDG. Although this is a protocol violation, the associated surrogate recoveries, except for 2-Fluorobiphenyl and o-Terphenyl in two samples, were acceptable and therefore no data required qualification. The 2-Fluorobiphneyl and o-Terphenyl surrogate recoveries in samples 108-S07-003 and 108-S07-003RE demonstrated a low bias and the associated results were qualified as estimated based on these surrogate recoveries.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Diesel range organics in samples	108-S07-003	108-SBG-001*	108-S13-001*
	108-S07-003RE	108-SBG-002	108-S13-002
	108-S07-004	108-SBG-004	108-S99-001
	108-S07-005	108-S07-006	108-S99-002
	108-SBG-003		

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Compound	LCS % R	LCSD % R	QC Limits	RPD	QC Limits
PBLKIRBS/D	Diesel range organics	49	45	60-140	-	≤50

Detected results for Diesel range organics may be biased low and false nondetects may have been reported.

V. Blank Contamination

A. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks or field blanks.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S07-004/108-S07-005:

• 200% for Motor oil range organics

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

VIII. Other Qualifications

A. No other qualifications were required.

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. The target compound identification was considered to be correct for samples 108-SBG-001* and 108-S13-001*.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total dissolved solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, Nitrite, and Total organic carbon..

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, Fluoride and Total organic carbon, 14 day analysis holding time requirements for Alkalinity, 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met with the exception listed below.

B. Due to holding time problems, the following detected results are qualified as estimated (Jh).

- Total dissolved solids in sample 108-S09-001

The analysis holding time of 7 days was exceeded by one day.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method. All Initial and Continuing calibration verification frequency percent recoveries (%R) were within the 90-110% QC limits.

B. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. Due to method blank contamination, the following results are considered nondetected (UJb).

- Total organic carbon in samples 108-S09-001 108-S12-001

The following contaminant concentrations were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, mg/L
Total organic carbon	MB	1.1

Detected results less than 5x the maximum blank contamination were qualified.

B. Due to field and equipment rinsate blank contamination, the following results are considered nondetected (UJb).

- Total organic carbon in samples 108-S09-001 108-S12-001

The following analytes were detected in the associated equipment rinsate blank at the concentration noted below.

Analyte	Blank ID	Concentration, mg/L
Nitrate	108-S99-002	0.10

Detected results less than 5x the maximum blank contamination were qualified.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

V. Matrix Duplicate

A. Matrix duplicate (DUP) analyses were reviewed for each matrix as applicable. All other relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-SBG-001* and 108-S13-001*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP volatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, except in two samples, were acceptable and therefore no data required qualification. The Toluene-d8 and 1,2-Dichloroethane-d4 surrogate recoveries in sample 108-S07-006 demonstrated a high bias and the associated sample detected results were qualified as estimated based on these surrogate recoveries. The Bromofluorobenzene surrogate recovery in sample 108-S07-006RE demonstrated a low bias and the associated sample results were qualified as estimated based on this surrogate recovery. The 1,2-Dichloroethane-d4 surrogate recoveries in samples 108-S12-001 and 108-S12-001RE demonstrated a high bias and the associated sample detected results were qualified as estimated based on these surrogate recoveries

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP semivolatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and therefore no data required qualification.

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP-pesticide/PCB analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries, with the exception of Tetrachloro-m-xylene and Decachlorobiphenyl in sample 108-S99-001, were acceptable and data did not require qualification. The Tetrachloro-m-xylene and Decachlorobiphenyl percent recovery demonstrated a high bias and the associated sample results were nondetected and therefore did not require qualification.

- Matrix spike/matrix spike duplicate sample analyses were not performed for TPHE analysis in this SDG. Although this is a protocol violation, the associated surrogate recoveries, except for 2-Fluorobiphenyl and o-Terphenyl in two samples, were acceptable and therefore no data required qualification. The 2-Fluorobiphneyl and o-Terphenyl surrogate recoveries in samples 108-S07-003 and 108-S07-003RE demonstrated a low bias and the associated results were qualified as estimated based on these surrogate recoveries.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Diesel range organics was at 0.12 mg/L and the laboratory reported detection limit for Motor oil range organics was at 0.25 mg/L. The Tetra Tech EMI required reporting limit is 0.1 mg/L for both compounds.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the technical holding time exceedance and initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound nondetected results were rejected in samples 108-S07-003RE, 108-S07-004DL, 108-S07-005DL, and 108-S02-003RE.

- Due to low RRFs in the initial calibration, Acetone and 2-Butanone nondetected results were rejected in samples 108-S02-003RE, 108-S07-005DL, 108-S07-004DL, 108-S00-005, 108-S07-003, 108-S07-004, 108-S07-005, 108-SBG-003, 108-SBG-001*, 108-SBG-004, 108-S09-001, and 108-S09-002, Acetone nondetected results were rejected in samples 108-S07-001, 108-S07-006, 108-S07-006RE, 108-S13-001*, 108-S13-002, 108-SBG-100, 108-S99-001, 108-S99-001RE, 108-S99-002, 108-S00-006, 108-S00-006RE, 108-S12-001, 108-S12-001RE, and 108-S02-003, and 2-Butanone nondetected results were rejected in sample 108-S07-003RE.

- Due to low RRFs in the continuing calibration, Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in samples 108-S07-005DL, 108-S02-003RE, and 108-S07-003RE, Acetone and 2-Butanone nondetected results were rejected in samples 108-S07-004DL, 108-S00-005, 108-S07-003, 108-S07-004, 108-S07-005, 108-SBG-003, 108-SBG-001*, 108-SBG-004, 108-S09-001, 108-S09-002, 108-S07-006, 108-S13-001*, 108-S13-002, 108-SBG-100, 108-S99-001, 108-S99-002, 108-S00-006, 108-S12-001, and 108-S02-003, and Acetone nondetected results were rejected in samples 108-S07-001, 108-S07-006RE, 108-S99-001RE, 108-S00-006RE, and 108-S12-001RE.

B. Due to technical holding time, instrument calibration, surrogate recovery, common laboratory contamination, internal standard, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound results are qualified as estimated in four samples and all volatile compound detected results were qualified as estimated in four samples.

- Due to initial calibration %RSD problems, Bromomethane and 2-Hexanone results were qualified as estimated in fourteen samples and 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone results were qualified as estimated in one sample.

- Due to initial calibration RRF problems, Acetone and 2-Butanone detected results were qualified as estimated in nine samples and Acetone detected results were qualified as estimated in fourteen samples.

- Due to continuing calibration %D problems, Bromomethane results were qualified as estimated in ten samples and 2-Hexanone results were qualified as estimated in one sample.

- Due to continuing calibration RRF problems, Acetone detected results were qualified as estimated in eleven samples and 2-Butanone detected results were qualified as estimated in nine samples.

- Due to common laboratory contamination problems, Acetone was qualified nondetect in two samples.

- Due to surrogate recovery problems, all volatile compound results were qualified as estimated in one sample and all volatile compound detected results were qualified as estimated in two samples.

- Due to internal standard problems, all volatile compound results were qualified as estimated in one sample and Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene results were qualified as estimated in two samples.

- Due to compound quantitation problems, Benzene, Toluene, Ethylbenzene, and Xylenes (total) detected results were qualified as estimated in two samples.

- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S07-006, 108-S00-006, and 108-S12-001 were reanalyzed due to surrogate and internal standard results exceeding the acceptance criteria, samples 108-S07-003, 108-S99-001, and 108-S02-003 were reanalyzed due to surrogate results exceeding acceptance criteria, and samples 108-S07-004 and 108-S07-005 were diluted due to sample results exceeding the calibration range. For samples 108-S07-004 and 108-S07-005 all results except Benzene, Toluene, Ethylbenzene, and Xylenes (total) should be considered the most usable. The Benzene, Toluene, Ethylbenzene, and Xylenes (total) results for samples 108-S07-004DL and 108-S07-005DL should be considered the most usable. The sample reanalyses 108-S07-003RE, 108-S99-001RE, 108-S02-003RE, 108-S00-006RE, and 108-S12-001RE, were outside holding time an there fore the original analyses, 108-S07-003, 108-S99-001, 108-S02-003, 108-S00-006, and 108-S12-001 should be considered the most usable. The results for sample 108-S07-006RE should be considered the most usable because the internal standard area counts were within acceptance criteria.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration and common laboratory and method blank contamination problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, 3-Nitroaniline and 2,4-Dinitrophenol results were qualified as estimated in seven samples.

- Due to continuing calibration problems, 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, and Benzo(b)fluoranthene results were qualified as estimated in three samples and 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and 4,6-Dinitro-2-methylphenol results were qualified as estimated in four samples.

- Due to common laboratory contamination problems, Bis(2-ethylhexyl)phthalate results were qualified nondetect in five samples.

- Due to method blank contamination problems, Unknown phthalate (24.90), Unknown phthalate (24.97), Unknown phthalate (25.06), Unknown phthalate (25.22) and Unknown phthalate (25.29) results were qualified nondetect in one sample.

- All tentatively identified compounds were qualified (NJ).

- All CLP SVOA detected results reported below the CRQL.

C. No samples were reextracted or reanalyzed for CLP semivolatile analysis in this SDG.

CLP Pesticide/PCB Analysis

A. No results for CLP pesticide/PCB analysis were rejected in this SDG.

B. Due to instrument calibration problems in the CLP pesticide/PCB analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration problems, Heptachlor and 4,4'-DDE results were qualified as estimated in seven samples.

C. No samples were reextracted or reanalyzed for CLP pesticide/PCB analysis in this SDG.

CLP Metals Analysis

A. No results for CLP metals analysis were rejected in this SDG.

B. Due to calibration blank, method blank, and equipment rinsate blank contamination, graphite furnace atomic absorption QC problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum was qualified nondetect in ten samples, Antimony was qualified nondetect in seven samples, Barium, Calcium, Magnesium, Manganese, Potassium, and Sodium were qualified nondetect in two samples, Chromium and Molybdenum were qualified nondetect in nine samples, Copper was qualified nondetect in three samples, Iron and Lead were qualified nondetect in one sample, Nickel was qualified nondetect in thirteen samples, Vanadium was qualified nondetect in eight samples, and Zinc was qualified nondetect in sixteen samples.

- Due to equipment rinsate blank contamination, Cadmium was qualified nondetect in nine samples.

- Due to low percent recovery in the GFAA QC, Thallium was qualified as estimated in one sample.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. Due to surrogate problems in the TPH gasoline analysis, several samples were qualified as estimated. The findings were as follows:

- Due to surrogate recovery problems, all TPHG detected results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to surrogate and LCS problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:

- Due to surrogate recovery problems, all TPHE results were qualified as estimated in two samples.

- Due to LCS recovery problems, Diesel range organics results were qualified as estimated in thirteen samples.

C. Sample 108-S07-003 was reextracted due to original sample surrogate recoveries exceeding acceptance criteria. The reextracted sample, 108-S07-003RE, also had low surrogate recoveries, therefore the original sample results should be considered the most usable.

Non-CLP Inorganic and Physical Analysis

A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.

B. Due to technical holding time and method blank contamination problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, Total dissolved solids results were qualified as estimated in one sample.

- Due to method blank contamination problems, Total organic carbon was qualified nondetect in two samples.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW05

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: February 25, 1999

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Metals, TPH Gasoline, TPH Extractables, and Non-CLP Inorganic and Physical Analysis

The wrong contract task order (CTO) number (No.) was referenced on page 1 of the data validation report. The CTO No. should be 069-108B01 not 069-109B01.

CLP Volatiles

1. Holding times: Only the detected target compounds 1,1-dichloroethene and vinyl chloride in sample 108-S04-006DL; cis-1,2-dichloroethene, trichloroethene, and vinyl chloride in samples 108-S04-008DL and 108-S04-009DL; 1,4-dichlorobenzene, trichloroethene, and cis-1,2-dichloroethene in sample 108-S04-005DL; and vinyl chloride in sample 108-S14-001DL were qualified as estimated. For sample 108-S04-005, all results except trichloroethene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and cis-1,2-dichloroethene should be considered most usable. Results for 1,4-dichlorobenzene and cis-1,2-dichlorobenzene in sample 108-S04-005DL; 1,2-dichlorobenzene in sample 108-S04-005DL2; and trichloroethene in sample 108-S04-005DL2 should be considered the most usable.

2. Other qualifications: Results for trichloroethene and 1,2-dichlorobenzene in sample 108-S04-005DL not 108-S04-005DL3 as listed were qualified as estimated. The result for trichloroethene in sample 108-S04-005DL2 not 108-S04-005DL1 as listed was qualified as estimated.

3. Field Duplicate: No target analytes were detected in field duplicates 108-S02-017/108-S02-018.

CLP Semivolatiles

1. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in the full validation sample.

2. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The full validation sample was found to be correctly quantitated.

CLP Metals

1. Blank contamination: Results for aluminum in sample 108-S04-008 and magnesium in sample 108-S13-003 were not qualified as listed in the data validation report.

TPH Gasoline

1. TCL Identification: The target compound gasoline range organics was identified correctly in full validation samples 108-S01-013 and 108-S14-001. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected gasoline range organic results in samples 108-S01-013, 108-S13-003, and 108-S14-001 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the gasoline standard used for calibration.

2. Field Duplicate: A low-level concentration of gasoline range organics was detected in field duplicate sample 108-S13-003 but not in sample 108-S13-004.

TPH Extractable Analysis

1. TCL Identification: The target compound motor oil range organics was identified correctly in full validation samples 108-S13-001 and 108-S14-001. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, detected results for diesel range organics and motor oil range organics in samples 108-S01-013, 108-S14-001, and 108-S23-002 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the diesel and motor oil standards used for calibration.

2. Matrix Spike/Matrix Spike Duplicate (MS/MSD): Only the target compound diesel range organics not motor oil range organics was qualified in sample 108-S19-001 based on MS/MSD recoveries.

Non-CLP Inorganic and Physical Analysis

1. Matrix spike: The nondetected result for sulfate in sample 108-S01-013 was rejected due to a severe matrix spike recovery. Detected results for sulfate in all other samples were qualified as estimated.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, Pei Jing, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2559A
Review Date:	January 2 through January 7, 1998
Sample Delivery Group (SDG) No.:	AAW05

Sample Nos.:

108-S23-002	108-S02-018	108-S22-002	108-S19-001
108-S04-006	108-S04-005	108-S22-002RE	108-S19-001RE
108-S04-006DL	108-S04-005DL1	108-S02-101	108-S23-002MS
108-S04-008	108-S04-005DL2	108-S00-007	108-S23-002MSD
108-S04-008DL	108-S13-003	108-S00-007RE	108-S23-002DUP
108-S04-009	108-S13-003RE	108-S02-021	108-S04-006MS
108-S04-009DL	108-S13-004	108-S02-021RE	108-S04-006MSD
108-S01-013*	108-S14-001*	108-S02-014	108-S04-006DUP
108-S01-013DL*	108-S14-001DL*	108-S02-014RE	108-S04-008MS
108-S02-100	108-S22-001	108-S00-008	108-S04-008MSD
108-S02-017	108-S22-001RE	108-S00-008RE	108-S04-008DUP
108-S02-017RE			

* Full Validation Sample

Matrix:	Water
Collection Date(s):	November 6 through November 10, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

* Holding times
  GC/MS instrument performance check
* Initial and continuing calibrations
* Blanks
* Surrogate recovery
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Internal standard performance
  Target compound identification
  Tentatively identified compounds
  Compound quantitation
  Reported detection limits
  System performance
* Overall assessment of data for the SDG

CLP Inorganic Parameters

* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
  ICP interference check sample
  GFAA quality control
* ICP serial dilution
  Sample result verification
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

* Method compliance
* Holding times
* Initial and continuing calibrations
* Blanks
* Matrix spike/matrix spike duplicate
* Laboratory control sample or blank spike
* Field duplicates
* Matrix duplicates
* Surrogate recovery
  Analyte quantitation
  Reported detection limits
* Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 7-8	pg. 8-9	N/A	pg. 9	√	pg. 9-12	pg. 12	pg. 12	pg. 13
SVOA	√	√	pg. 15	N/A	pg. 15	pg. 15	pg. 16	√	N/A	√
Metals	√	N/A	√	√	√	pg. 18-19	√	N/A	pg. 20-21	pg. 20,21
TPHG	√	pg. 22	√	N/A	√	√	√	N/A	pg. 23	pg. 23
TPHE	√	pg. 24	pg. 24	N/A	pg. 25	pg. 25	√	N/A	√	√
Alkalinity	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfide	√	N/A	√	√	√	√	√	N/A	N/A	√
TOC	√	N/A	√	√	pg. 28-29	√	pg. 27	N/A	N/A	√
TDS	√	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	√	√	√	√	√	N/A	N/A	√
Chloride	√	N/A	pg. 28	pg. 28	√	√	√	N/A	N/A	√
Fluoride	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfate	√	N/A	pg. 28	pg. 28	√	√	√	N/A	N/A	√
Phosphate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-S01-013*, 108-S01-013DL*, 108-S14-001*, and 108-S14-001DL*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 14	√	N/A	N/A
SVOA	√	√	√	√	pg. 17	√	N/A	N/A
Metals	N/A	√	√	√	N/A	N/A	pg. 21	√
TPHG	N/A	√	√	√	N/A	N/A	N/A	N/A
TPHE	N/A	√	√	√	N/A	N/A	N/A	N/A
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 29	N/A	N/A	N/A	N/A
TOC	N/A	√	√	√	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to grossly exceeded holding times, the following detected results are estimated and the nondetected results are rejected (Jh/Rh).

• All volatile compounds in samples	108-S04-006DL	108-S14-001DL*	108-S02-014RE
	108-S04-008DL	108-S22-001RE	108-S00-008RE
	108-S04-009DL	108-S22-002RE	108-S19-001RE
	108-S04-005DL1	108-S00-007RE	108-S04-005DL3
	108-S13-003RE	108-S02-021RE	

The analysis holding time of 14 days for preserved waters was exceeded by 22 days in samples	108-S04-006DL 108-S04-008DL	108-S04-009DL
The analysis holding time of 14 days for preserved waters was exceeded by 21 days in samples	108-S04-005DL1 108-S13-003RE 108-S14-001DL* 108-S22-001RE	108-S22-002RE 108-S00-007RE 108-S04-005DL3
The analysis holding time of 14 days for preserved waters was exceeded by 18 days in samples	108-S02-021RE 108-S02-014RE	108-S00-008RE 108-S19-001RE

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following detected and nondetected results are qualified as estimated (Ja/UJa).

• All volatile compounds in samples	108-S22-002	108-S00-007
	108-S22-001	108-S02-014RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S22-002	Bromofluorobenzene	75	80-120
108-S22-001	Bromofluorobenzene	74	80-120
108-S00-007	Bromofluorobenzene	76	80-120
108-S02-014RE	1,2-Dichloroethane-d4	57	80-120
108-S02-014RE	Toluene-d8	124	80-120

Low recoveries indicate that detected and nondetected results may be biased low.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in samples 108-S19-001 108-S19-001RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S19-001	1,2-Dichloroethane-d4	155	80-120
108-S19-001RE	Toluene-d8	127	80-120

High percent recoveries indicate that detected results may be biased high.

C. The other surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S02-017RE	1,2-Dichloroethane-d4	161	80-120
108-S13-003	1,2-Dichloroethane-d4	122	80-120
108-S02-021	1,2-Dichloroethane-d4	134	80-120
108-S02-014	1,2-Dichloroethane-d4	134	80-120
108-S00-008	1,2-Dichloroethane-d4	127	80-120
108-S22-002RE	Toluene-d8	136	80-120
108-S00-007RE	Toluene-d8	148	80-120
108-S00-008RE	Toluene-d8	131	80-120

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD percent recoveries (%R) and relative percent differences (RPD) that did not meet the CLP limits are listed below.

Sample ID	Compound	MS %R	MSD %R	QC Limits
108-S19-001	Acetone	257	204	0-200
108-S19-001	1.2-Dichloroethane	148	-	60-140
108-S19-001	1,1-2-Trichloroethane	150	-	60-140
108-S19-001	1,2-Dibromoethane	152	-	60-140

Although the above listed recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

The other RPDs outside of the CLP Limits are listed below.

Sample ID	Compound	RPD	QC Limits
108-S19-001MS/MSD	Carbon tetrachloride	21	≤20
108-S19-001MS/MSD	Tetrachloroethene	30	≤20

Since the individual MS/MSD percent recoveries were acceptable, no data required qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits with the exceptions listed below.

B. The other %Rs outside of the QC Limits are listed below.

LCS ID	Compound	LCS %R	LCSD %R	QC Limits
VBLKNPBS/BSD	Acetone	-	211	0-200

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

C. The other RPDs outside of the QC Limits are listed below.

LCS ID	Compound	RPD	QC Limits
VBLKOMBS/BSD	Bromomethane	69	≤40
VBLKNSBS/BSD	Bromomethane	65	≤40
VBLKNSBS/BSD	Acetone	44	≤40
VBLKNSBS/BSD	2-Hexanone	45	≤40
VBLKNPBS/BSD	Acetone	48	≤40
VBLKNPBS/BSD	cis-1,3-Dichloropropene	25	≤20
VBLKOSBS/BSD	Bromomethane	72	≤40
VBLKOPBS/BSD	2-Butanone	70	≤40
VBLKQRBS/BSD	Bromomethane	56	≤40
VBLKQRBS/BSD	1,1-Dichloroethane	64	≤40
VBLKQRBS/BSD	Carbon disulfide	44	≤40

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. No common laboratory contaminants were found in the samples and no volatile contaminants were found in the method blanks and trip blanks.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

• Bromomethane and 2-Hexanone in samples	108-S23-002	108-S02-017RE	108-S22-001
	108-S04-006	108-S02-018	108-S22-002
	108-S04-008	108-S04-005	108-S00-007
	108-S04-009	108-S04-005DL1	108-S02-021
	108-S01-013*	108-S13-003	108-S02-014
	108-S01-013DL*	108-S13-004	108-S00-008
	108-S02-017	108-S14-001*	108-S19-001
• 1,1-Dichloroethene in samples	108-S22-002RE	108-S02-021RE	108-S00-008RE
	108-S00-007RE	108-S02-014RE	108-S19-001RE

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/19/97	Bromomethane	31.2
11/19/97	2-Hexanone	31.9
12/11/97	1,1-Dichloroethene	34.0

B. Due to initial calibration problems, the following nondetected results are rejected (Rf).

• Acetone in samples	108-S23-002	108-S02-017RE	108-S22-001
	108-S04-006	108-S02-018	108-S22-002
	108-S04-008	108-S04-005	108-S00-007
	108-S04-009	108-S04-005DL1	108-S02-021
	108-S01-013*	108-S13-003	108-S02-014
	108-S01-013DL*	108-S13-004	108-S00-008
	108-S02-017	108-S14-001*	108-S19-001
• Acetone, 2-Butanone, 4-Methyl-2-pentanone, 2-Hexanone, and 1,2-Dibromo-3-chloropropane in samples		108-S22-002RE	108-S02-014RE
		108-S00-007RE	108-S00-008RE
		108-S02-021RE	108-S19-001RE
• Acetone and 2-Butanone in samples	108-S04-006DL	108-S04-005DL2	108-S22-001RE
	108-S04-008DL	108-S13-003RE	108-S04-005DL3
	108-S04-009DL	108-S14-001DL*	

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
11/19/97	Acetone	0.045
12/11/97 (V)	Acetone	0.028
12/11/97 (V)	2-Butanone	0.022
12/11/97 (V)	4-Methyl-2-pentanone	0.049
12/11/97 (V)	2-Hexanone	0.026
12/11/97 (V)	1,2-Dibromo-3-chloropropane	0.049
12/11/97 (R)	Acetone	0.015
12/11/97 (R)	2-Butanone	0.028

C. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Acetone in samples	108-S02-021	108-S02-014	108-S00-008	108-S19-001
• Vinyl chloride and Chloroethane in samples		108-S22-002RE 108-S00-007RE	108-S02-021RE 108-S02-014RE	108-S00-008RE 108-S19-001RE

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Calibration Date	Compound	%D
11/24/97	Acetone	40.0
12/12/97	Vinyl chloride	52.3
12/12/97	Chloroethane	51.6

D. Due to continuing calibration problems, the following nondetected results are as rejected (Rf).

• Acetone and 2-Butanone in samples	108-S04-006DL 108-S04-008DL 108-S04-009DL 108-S13-003RE 108-S14-001DL* 108-S22-001RE	108-S04-005DL3 108-S04-005DL2 108-S23-002 108-S04-006 108-S04-008	108-S04-009 108-S02-021 108-S02-014 108-S00-008 108-S19-001
• Acetone in samples	108-S01-013* 108-S02-017 108-S02-018 108-S04-005 108-S13-004	108-S22-002 108-S01-013DL* 108-S02-017RE 108-S04-005DL1	108-S13-003 108-S14-001* 108-S22-001 108-S00-007
• Acetone, 2-Butanone, 2-Hexanone, and 1,2-Dibromo-3-chloropropane in samples		108-S22-002RE 108-S00-007RE 108-S02-021RE	108-S02-014RE 108-S00-008RE 108-S19-001RE

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.022
12/11/97	Acetone	0.013
12/11/97	2-Butanone	0.021
11/20/97 (VAB20)	Acetone	0.034
11/20/97 (VAB20)	2-Butanone	0.047
11/20/97 (VBB20)	Acetone	0.038
11/21/97	Acetone	0.038
11/24/97	Acetone	0.027

11/24/97	2-Butanone	0.040
12/12/97	Acetone	0.024
12/12/97	2-Butanone	0.022
12/12/97	2-Hexanone	0.029
12/12/97	1,2-Dibormo-3-chloropropane	0.041

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time with the exceptions listed below.

B. Due to internal standard problems, the following detected and nondetected results are qualified as estimated (Je/UJe).

• Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene in samples	108-S02-017RE 108-S22-002RE	108-S00-007RE 108-S19-001RE

The internal standard area counts in the samples listed above were less than one half of the reference standard and are listed below.

Sample	Internal Standard	Area	QC Limits
108-S02-017RE	1,2-Dichlorobenzene-d4	341229	343997-802661
108-S22-002RE	1,2-Dichlorobenzene-d4	121625	122122-284950
108-S00-007RE	1,2-Dichlorobenzene-d4	120271	122122-284950
108-S19-001RE	1,2-Dichlorobenzene-d4	114383	122122-284950

Internal standard area counts of less than 50% of the standard area count may indicate a loss of instrument sensitivity.

VIII. Field Duplicate

A. No RPDs were outside of the QC limits for field duplicate samples 108-S13-003/108-S13-004 and 108-S04-008DL/108-S04-009DL.

B. The following RPDs were obtained for the field duplicate samples 108-S04-008/108-S04-009:

- 28% for 1,4-Dichlorobenzene

The following RPDs were obtained for the field duplicate samples 108-S02-017/108-S02-018:

- 200% for Vinyl chloride

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

• 1,1-Dichloroethene and Trichloroethene in sample	108-S04-006
• Vinyl chloride, Trichloroethene, and cis-1,2-Dichloroethene in samples	108-S04-008 108-S04-009
• Vinyl chloride, Toluene, and cis-1,2-Dichloroethene in sample	108-S01-013*
• Trichloroethene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, and cis-1,2-Dichloroethene in sample	108-S04-005
• Trichloroethene and 1,2-Dichlorobenzene in sample	108-S04-005DL3
• Trichloroethene in sample	108-S04-005-DL1
• Vinyl chloride in sample	108-S14-001*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-S01-013*, 108-S01-013DL*, 108-S14-001*, and 108-S14-001DL*

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated except for samples 108-S01-013DL* and 108-S04-005DL2 for which the TIC Form Is were not provided by the laboratory due to file problems.

TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles.

II. Surrogate Recovery

A. Surrogate recoveries were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable except for 4-Nitrophenol in the LCS SBLKDRBS/BSD, and therefore no data required qualification. Since the recoveries demonstrated a high bias and the associated sample results were nondetected, data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. The results obtained in the analysis of the LCS not within the control limits are shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKDRBS/D	4-Nitrophenol	83	87	10-80	-	-

Although the above listed recoveries demonstrate a high bias, the associated samples results were nondetected and therefore were not qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Bis(2-ethylhexyl)phthalate in sample 108-S01-013*

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No results were qualified based on the method blank contamination and no field blanks were identified for semivolatile analysis in this SDG.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- 3-Nitroaniline and 2,4-Dinitrophenol in sample 108-S01-013*

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/7/97	3-Nitroaniline	34.8
11/7/97	2,4-Dinitrophenol	30.5

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

- 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and 4,6-Dinitro-2-methylphenol in sample 108-S01-013*

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/19/97	2,2'-Oxybis(1-chloropropane)	78.8
11/19/97	N-Nitroso-di-n-propylamine	25.6
11/19/97	4-Chloroaniline	30.9
11/19/97	3-Nitroaniline	55.3
11/19/97	2,4-Dinitrophenol	40.4
11/19/97	4-Nitrophenol	27.0
11/19/97	4-Nitroaniline	27.0
11/19/97	4,6-Dinitro-2-methylphenol	27.1

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. No field duplicates were identified in this SDG.

IX. Other Qualifications

A. No other qualifications were required.

*Full Validation Criteria for Sample 108-S01-013**

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in sample 108-S01-013*

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in sample 108-S01-013*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S23-002	108-S02-017	108-S13-004	108-S02-021
	108-S04-006	108-S02-018	108-S14-001*	108-S02-014
	108-S04-008	108-S04-005	108-S22-001	108-S19-001
	108-S01-013*	108-S13-003	108-S22-002	
• Antimony in samples	108-S23-002	108-S01-013*	108-S13-003	108-S22-002
	108-S04-006	108-S02-017	108-S13-004	108-S02-021
	108-S04-008	108-S02-018	108-S14-001*	108-S19-001
	108-S04-009	108-S04-005	108-S22-001	
• Chromium in samples	108-S23-002	108-S04-005	108-S13-004	108-S22-002
	108-S04-008	108-S13-003	108-S14-001*	108-S19-001
	108-S01-013*			
• Iron in sample	108-S04-006			
• Magnesium in sample	108-S13-003			
• Nickel in samples	108-S23-002	108-S01-013*	108-S14-001*	108-S02-014
• Silver in samples	108-S04-006	108-S02-018	108-S02-021	108-S02-014
	108-S02-017			

• Vanadium in samples	108-S23-002 108-S04-006 108-S04-008	108-S02-018 108-S04-005 108-S13-003	108-S13-004 108-S14-001* 108-S22-001	108-S22-002 108-S19-001
• Zinc in samples	108-S04-008 108-S01-013*	108-S13-003 108-S13-004	108-S14-001*	108-S19-001
• Molybdenum in samples	108-S23-002 108-S04-006 108-S02-017	108-S02-018 108-S04-005 108-S13-003	108-S13-004 108-S14-001* 108-S22-001	108-S02-021 108-S19-001

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	PB	22.62
Aluminum	CCB	74.8
Antimony	CCB	3.3
Calcium	PB	22.72
Calcium	CCB	40.2
Chromium	CCB	0.7
Iron	CCB	18.3
Lead	CCB	1.4
Magnesium	PB	5.72
Magnesium	CCB	31.4
Manganese	CCB	1.3
Nickel	CCB	0.8
Potassium	PB	71.84
Potassium	CCB	114.4
Silver	CCB	0.8
Vanadium	CCB	1.1
Zinc	PB	1.22
Molybdenum	CCB	1.0

Detected results less than 5x the maximum blank contamination were qualified.

B. No field blanks were identified for metals analysis in this SDG.

IV. Matrix Spike (MS)

A. Percent recoveries (%R) were within the 75-125% CLP limits.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤10.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. Due to ICP serial dilution problems, the following detected results are qualified as estimated (Jh).

• Potassium in samples	108-S23-002	108-S01-013*	108-S13-003	108-S22-002
	108-S04-006	108-S02-017	108-S13-004	108-S02-021
	108-S04-008	108-S02-018	108-S14-001*	108-S02-014
	108-S04-009	108-S04-005	108-S22-001	108-S19-001

The percent difference between the original sample result and the serial dilution result was outside the QC limits of 10% for analyte concentrations greater than 50x the IDL as shown below.

Sample ID	Analyte	Original Concentration	50x IDL	%D
108-S19-001	Potassium	25008 ug/L	1190.0	13.9

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S04-008/108-S04-009:

- 170% for Aluminum
- 51% for Antimony
- 31% for Barium
- 200% for Cadmium
- 162% for Chromium
- 109% for Cobalt
- 100% for Copper
- 179% for Iron
- 100% for Nickel
- 68% for Vanadium

The following RPDs were obtained for the field duplicate samples 108-S02-017/108-S02-018:

- 33% for Aluminum
- 97% for Antimony
- 95% for Cadmium
- 31% for Nickel
- 28% for Selenium
- 49% for Silver
- 200% for Vanadium
- 58% for Zinc

- 67% for Molybdenum

The following RPDs were obtained for the field duplicate samples 108-S13-003/108-S13-004:

- 26% for Aluminum
- 51% for Chromium
- 92% for Zinc

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-01-013* and 108-S14-001*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. The analytical spike recoveries were within the 85-115% CLP limits.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference with the exception of Molybdenum. All associated sample results were detected and therefore were not qualified. The absolute values of all analytes were ≤ IDL .

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met for TPHG.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All TPHG compounds in sample 108-S14-001*

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S14-001*	4-Bromofluorobenzene	Interference	75-125%

There was matrix interference in this sample.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate percent recoveries (%R) were within the 75-125% QC limits and the relative percent differences (RPD) were ≤30 .

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks and no field blanks were identified for TPHG analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or

equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S13-003/108-S13-004:

- 200% for TPH gasoline

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

VIII. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All TPHG detected results reported below the Tetra Tech EMI required report limit (RL) for sample 108-S13-003.

Detected results reported below the RL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-S01-013* and 108-S14-001*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-S01-013* and 108-S14-001*.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for unpreserved waters were met for TPHE.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following nondetected results are qualified as estimated (UJa).

- All TPHE compounds in samples 108-S22-001 108-S22-001RE

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S22-001	o-Terphenyl	55	60-140%
108-S22-001RE	o-Terphenyl	56	60-140%

Low recoveries indicate that detected and nondetected results may be biased low.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/Matrix spike duplicate samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 50-150% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to accuracy problems in the MS/MSD analysis, the following nondetected results are qualified as estimated (UJc).

- All TPHE compounds in samples 108-S19-001

The recoveries that did not meet the QC limits are listed below.

Sample ID	Compound	MS %R	MSD %R	QC Limits
108-S19-001	Diesel range organics	40	33	50 - 150%

Only the spiked sample was affected by this outlier. Detected results for Diesel range organics were biased low.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Diesel range organics in samples	108-S23-002	108-S13-004	108-S22-001RE
	108-S01-013*	108-S14-001*	108-S22-002
	108-S13-003	108-S22-001	108-S19-001

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Compound	LCS % R	LCSD % R	QC Limits	RPD	QC Limits
PBLKJDBS/D	Diesel range organics	45	51	60-140	-	≤50

Detected results for Diesel range organics may be biased low and false nondetects may have been reported.

V. Blank Contamination

A. Due to method blank contamination, the following results are considered nondetected (UJb).

• Motor oil range organics in samples	108-S23-002	108-S01-013*	108-S14-001*

The following compounds were detected in the associated method blanks at the concentrations noted below.

Compound	Blank ID	Concentration, mg/L
Motor oil range organics	PBLKJD	0.48

Detected results less than 5x the blank contamination were qualified.

B. No field blanks were identified for TPHE analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No TPHE compound were detected in the field duplicate pair 108-S13-003/108-S13-004.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S01-013* and 108-S14-001*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-S01-013* and 108-S14-001*.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total dissolved solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, Nitrite, and Total organic carbon..

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, Fluoride and Total organic carbon, 14 day analysis holding time requirements for Alkalinity, 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method. All Initial and Continuing calibration verification frequency percent recoveries (%R) were within the 90-110% QC limits with the exceptions listed below.

B. Due to calibration problems, the following detected results are estimated (Jf).

• Total organic carbon (TOC) in samples	108-S23-002	108-S01-013**	108-S14-001**
	108-S04-006	108-S04-005	108-S22-001
	108-S04-008	108-S13-003	108-S22-002

The ICV percent recovery for TOC was 110.3%, the CCV2 percent recovery for TOC was 110.5% and the CCV3 percent recovery for TOC was 111.1, outside the control limits of 90-110%.

C. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. No contaminant concentrations were found in the method blanks and no field blanks were identified for inorganic or physical analysis in this SDG.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

B. Due to a severe problem in the MS analysis, the following detected results are estimated and the nondetected results are rejected (Jc/Rc).

• Chloride in samples	108-S01-013** 108-S04-005	108-S13-003 108-S14-001**	108-S22-001 108-S22-002	108-S02-021
• Sulfate in samples	108-S01-013** 108-S02-017	108-S04-005 108-S13-003	108-S14-001** 108-S22-001	108-S22-002 108-S02-021

The recoveries that did not meet the QC limits are listed below.

Sample ID	Analyte	MS %R	MS %R	QC Limits
108-S22-002	Chloride	42.1	4.5	75-125
108-S22-002	Sulfate	24.3	12.5	75-125

Spike recoveries below 30% indicate that detects may be biased low and false nondetects may have been reported.

C. The relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

V. Matrix Duplicate

A. Matrix duplicate (DUP) analyses were reviewed for each matrix as applicable. All other relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

B. Due to precision problems in the matrix duplicate analysis, the following detected and nondetected results are qualified as estimated (Jd/UJd).

• Sulfate in samples	108-S04-008 108-S01-013** 108-S02-017	108-S04-005 108-S13-003	108-S14-001** 108-S22-001	108-S22-002 108-S02-021
• Chloride in samples	108-S01-013** 108-S04-005	108-S13-003 108-S14-001**	108-S22-001 108-S22-002	108-S02-021

The following analytes had relative percent differences (RPD) outside the QC limits.

Duplicate Sample ID	Analyte	RPD	QC Limits
108-S04-008	Sulfate	21.3	≤20
108-S22-002	Chloride	162	≤20
108-S22-002	Sulfate	64.3	≤20

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits and the relative percent differences (RPD) were within the laboratory established QC limits with the exceptions listed below.

B. Due to a problem in the LCS, the following detected results are qualified as estimated (Jh).

• Total organic carbon in samples	108-S23-002	108-S04-008	108-S13-003
	108-S04-006	108-S04-005	108-S14-001**

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Analyte	LCS %R	LCSD %R	QC Limits
97GTC292LCS/LCSD	TOC	-	123	80-120%

The results reported for TOC in the samples listed above may be biased high.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S01-013 and 108-S14-001*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were <u>not</u> consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP semivolatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable except for 4-Nitrophenol in the LCS SBLKDRBS/BSD, and therefore no data required qualification. Since the recoveries demonstrated a high bias and the associated sample results were nondetected no data was qualified.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the technical holding time exceedance and initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound nondetected results were rejected in samples 108-S04-006DL, 108-S04-008DL, 108-S04-009DL, 108-S04-005DL1, 108-S13-003RE, 108-S14-001DL*, 108-S22-001RE, 108-S22-002RE, 108-S00-007RE, 108-S02-021RE, 108-S02-014RE, 108-S00-008RE, 108-S19-001RE, and 108-S04-005DL3.

- Due to low RRFs in the initial calibration, Acetone nondetected results were rejected in samples 108-S23-002, 108-S04-006, 108-S04-008, 108-S04-009, 108-S01-013*, 108-S01-013DL*, 108-S02-017, 108-S02-017RE, 108-S02-018, 108-S04-005, 108-S04-005DL1, 108-S13-003, 108-S13-004, 108-S14-001*, 108-S22-001, 108-S22-002, 108-S00-007, 108-S02-021, 108-S02-014, 108-S00-008, and 108-S19-001, Acetone, 2-Butanone, 4-Methyl-2-pentanone, 2-Hexanone, and 1,2-Dibromo-3-chloropropane nondetected results were rejected in samples 108-S22-002RE, 108-S00-007RE, 108-S02-021RE, 108-S02-014RE, 108-S00-008RE, and 108-S19-001RE, and Acetone and -2-Butanone nondetected results were rejected in samples 108-S04-006DL, 108-S04-008DL, 108-S04-009DL, 108-S04-005DL2, 108-S13-003RE, 108-S14-001DL*, 108-S22-001RE, and 108-S04-005DL3.

- Due to low RRFs in the continuing calibration, Acetone and 2-Butanone nondetected results were rejected in samples 108-S04-006DL, 108-S04-008DL, 108-S04-009DL, 108-S13-003RE, 108-S14-001DL*, 108-S22-001RE, 108-S04-005DL3, 108-S04-005DL2, 108-S23-002, 108-S04-006, 108-S04-008, 108-S04-009,

108-S02-021, 108-S02-014, 108-S00-008, and 108-S19-001, Acetone nondetected results were rejected in samples 108-S01-013*, 108-S02-017, 108-S02-018, 108-S04-005, 108-S13-004, 108-S22-002, 108-S01-013DL*, 108-S02-017RE, 108-S04-005DL1, 108-S13-003, 108-S14-001*, 108-S22-001, and 108-S00-007, and Acetone, 2-Butanone, 2-Hexanone, and 1,2-Dibromo-3-chloropropane nondetected results were rejected in samples 108-S22-002RE, 108-S00-007RE, 108-S02-021RE, 108-S02-014RE, 108-S00-008RE, and 108-S19-001RE.

B. Due to technical holding time, instrument calibration, surrogate recovery, internal standard, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound detected results were qualified as estimated in fourteen samples.
- Due to initial calibration %RSD problems, Bromomethane and 2-Hexanone results were qualified as estimated in twenty-one samples and 1,1-Dichloroethene results were qualified as estimated in six samples.
- Due to continuing calibration %D problems, Acetone results were qualified as estimated in four samples and Vinyl chloride and Chloroethane results were qualified as estimated in six samples.
- Due to surrogate recovery problems, all volatile compound results were qualified as estimated in four samples and all volatile compound detected results were qualified as estimated in two samples.
- Due to internal standard problems, Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene results were qualified as estimated in four samples.
- Due to compound quantitation problems, Trichloroethene detected results were qualified as estimated in six samples, Vinyl chloride and cis-1,2-Dichlorethene detected results were qualified as estimated in three samples, Toluene, 1,4-Dichlorobenzene, and 1,1-Dichloroethene detected results were qualified as estimated in one sample, and 1,2-Dichlorobenzene detected results were qualified as estimated in two samples.
- All tentatively identified compounds were qualified (NJ).

C. Sample 108-S02-017 was reanalyzed due to carry over contamination, samples 108-S13-003, 108-S22-001, 108-S22-002, 108-S00-007, 108-S02-021, 108-S02-014, 108-S00-008, and 108-S19-001 were reanalyzed due to surrogate results exceeding the acceptance criteria, and samples 108-S04-006, 108-S04-008, 108-S04-009, 108-S01-013*, 108-S04-005, and 108-S14-001* were diluted due to sample results exceeding the calibration range. For sample 108-S04-006 all results except 1,1-Dichloroethene should be considered the most usable. The 1,1-Dichloroethene results for sample 108-S04-006DL should be considered the most usable. For samples 108-S04-008 and 108-S04-009 all results except Vinyl chloride, Trichloroethene, and cis-1,2-Dichloroethene should be considered the most usable. The except Vinyl chloride, Trichloroethene, and cis-1,2-Dichloroethene results for samples 108-S04-008DL and 108-S04-009DL should be considered the most usable. For sample 108-S01-013* all results except Vinyl chloride, Toluene, and cis-1,2-Dichloroethene should be considered the most usable. The Vinyl chloride, Toluene, and cis-1,2-Dichloroethene results for sample 108-S01-013DL* should be considered the most usable. For sample 108-S04-005 all results except Trichloroethene, 1,4-

Dichlorobenzene, and cis-1,2-Dichloroethene should be considered the most usable. The 1,4-Dichlorobenzene results for sample 108-S04-005DL3, the 1,2-Dichlorobenzene results for sample 108-S04-005DL1, and the Trichloroethene results for sample 108-S04-005DL2 should be considered the most usable. For sample 108-S14-001* all results except Vinyl chloride should be considered the most usable. The Vinyl chloride results for sample 108-S14-001DL* should be considered the most usable. The original sample analysis for 108-S02-017 had carry over contamination and therefore the reanalysis, 108-S02-017RE, should be considered the most usable. The sample reanalysis 108-S13-003RE, 108-S22-001RE, 108-S22-002RE, 108-S00-007RE, 108-S02-021RE, 108-S02-014RE, 108-S00-008RE, and 108-S19-001RE were outside holding time and therefore the original analyses, 108-S13-003, 108-S22-001, 108-S22-002, 108-S00-007, 108-S02-021, 108-S02-014, 108-S00-008, and 108-S19-001 should be considered the most usable.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration and common laboratory and method blank contamination problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration %RSD problems, 3-Nitroaniline and 2,4-Dinitrophenol results were qualified as estimated in one sample.
- Due to continuing calibration problems, 2,2'-Oxybis(1-chloropropane), N-Nitroso-di-n-propylamine, 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and 4,6-Dinitro-2-methylphenol results were qualified as estimated in one sample.
- Due to common laboratory contamination problems, Bis(2-ethylhexyl)phthalate results were qualified nondetect in one sample.
- All tentatively identified compounds were qualified (NJ).

C. No samples were reextracted or reanalyzed for CLP semivolatile analysis in this SDG.

CLP Metals Analysis

A. No results for CLP metals analysis were rejected in this SDG.

B. Due to calibration blank and method blank contamination ICP serial dilution problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum and Antimony were qualified nondetect in fifteen samples, Chromium was qualified nondetect in nine samples, Iron and Magnesium were qualified nondetect in one sample, Nickel was qualified nondetect in four samples, Silver was qualified nondetect in five samples, Vanadium and Molybdenum were qualified nondetect in eleven samples, and Zinc was qualified nondetect in six samples.
- Due to ICP serial dilution problems, Potassium was qualified as estimated in sixteen samples.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. Due to surrogate problems in the TPH gasoline analysis, several samples were qualified as estimated. The findings were as follows:

- Due to surrogate recovery problems, all TPHG detected results were qualified as estimated in one sample.

- All detected results reported below the Tetra Tech EMI required report limit (RL) were qualified as estimated.

C. No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to surrogate recovery, MS/MSD, LCS, and method blank contamination problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:

- Due to surrogate recovery problems, all TPHE results were qualified as estimated in two samples.

- Due to MS/MSD spike recovery problems, Diesel range organics results were qualified as estimated in one sample.

- Due to LCS recovery problems, Diesel range organics results were qualified as estimated in nine samples.

- Due to method blank contamination problems, Motor oil range organics were qualified nondetect in three samples.

C. Sample 108-S22-003 was reextracted due to original sample surrogate recoveries exceeding acceptance criteria. The reextracted sample, 108-S22-003RE, also had low surrogate recoveries, therefore the original sample results should be considered the most usable.

Non-CLP Inorganic and Physical Analysis

A. Due to severe problems in the MS percent recovery in the inorganic and physical analysis, selected sample results were rejected. The findings were as follows:

- Due to technical low MS recoveries, Chloride nondetected results were rejected in samples 108-S01-013*, 108-S04-005, 108-S13-003, 108-S14-001, 108-S22-001, 108-S22-002, and 108-S02-021, and Sulfate nondetected results were rejected in

samples 108-S01-013*, 108-S02-0017, 108-S04-005, 108-S13-003, 108-S14-001, 108-S22-001, 108-S22-002, and 108-S02-021,

B. Due to instrument calibration, MS, DUP, and LCS problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial and continuing calibration problems, Total organic carbon detected results were qualified as estimated in nine samples.
- Due to MS recovery problems, Chloride detected results were qualified as estimated in seven samples and Sulfate detected results were qualified as estimated in eight samples.
- Due to DUP precision problems, Chloride results were qualified as estimated in seven samples and Sulfate results were qualified as estimated in nine samples.
- Due to LCS recovery problems, Total organic carbon detected results were qualified as estimated in six samples.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW06

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: February 25, 1999

Analyses affected: CLP Volatiles, CLP Semivolatiles, CLP Pesticide/PCBs, TPH Gasoline, TPH Extractables, and Non-CLP Inorganic and Physical Analysis

The wrong contract task order (CTO) number (No.) was referenced on page 1 of the data validation report. The CTO No. should be 069-108B01 not 069-109B01. Additionally, sample 108-S02-105 was omitted from page 1 of the data validation report.

CLP Volatiles

1. Holding times: Chlorobenzene in sample 108-S02-009DL was qualified as estimated.

2. Calibrations: Due to relative response factor (RRF) problems, the detected result for acetone in sample 108-S02-016 were qualified as estimated. Acetone results in the other listed samples were rejected.

CLP Semivolatiles

1. TCL identification: Target compound identification was considered to be correct. Positive TCL results were detected in the full validation samples.

2. Compound quantitation: Sample results were recalculated with the proper dilution factors and volumes to calculate the sample results. The full validation samples were found to be correctly quantitated.

CLP Pesticide/PCB

1. Pesticide cleanup checks: Florisil checks were performed and all recoveries were within specified QC limits.

2. TCL identification: No pesticide/PCB compounds were detected in the full validation sample.

3. Compound quantitation: No pesticide/PCB compounds were detected in the full validation sample. The reported detection limits were consistent with Tetra Tech EMI's required reporting limits and reflect any dilutions and volumes.

TPH Gasoline

1. TCL identification: No gasoline was detected in full validation samples 108-S22-004 and 108-S22-003. No signs of false negatives were observed by the reviewer.

2. Compound quantitation: No gasoline was detected in the full validation samples.

TPH Extractable Analysis

1. TCL Identification: The target compound diesel range organics was identified correctly in full validation sample 108-S22-004. No target compounds were detected in full validation sample 108-S22-003. No signs of false positives or false negatives were observed by the reviewer. Due to pattern match problems, the detected result for diesel range organics in sample 108-S22-004 was qualified as estimated. The fuel pattern in the above sample did not show a reasonable match to the diesel standard used for calibration.

Non-CLP Inorganic and Physical Analysis

1. Holding times: The detected and nondetected results for sulfide in samples 108-S22-004 and 108-S02-009 were qualified as estimated (Jh/UJh) not rejected as indicated in the data validation report.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	Naval Air Station, Alameda
Contract Task Order (CTO) No.:	069-109B01
Laboratory:	RECRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dan Ho, Stella Sibayan, Pei Jing, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2559B
Review Date:	January 5 through January 8, 1998
Sample Delivery Group (SDG) No.:	AAW06

Sample Nos.:

108-S22-004*	108-S09-003RE	108-S04-004	108-S16-001DUP
108-S22-004RE*	108-S00-009	108-S04-004RE	108-S07-002MS
108-S02-009*	108-S00-009RE	108-S01-014	108-S07-002MSD
108-S02-009DL*	108-S22-003*	108-S01-014RE	108-S07-002DUP
108-S02-016	108-S22-003RE*	108-S02-104*	108-S22-003MS
108-S02-016RE	108-S02-103*	108-S00-100	108-S22-003DUP
108-S16-001	108-S02-011	108-S00-100RE	108-S02-011MS
108-S16-002	108-S05-013	108-S22-004MS	108-S02-011MSD
108-S02-102	108-S05-014	108-S22-004DUP	108-S02-011DUP
108-S07-002	108-S23-001	108-S16-001MS	108-S05-013MS
108-S07-002RE	108-S00-010	108-S16-001MSD	108-S05-013MSD
108-S09-003			

* Full Validation Sample

Matrix:	Water
Collection Date(s):	November 10 through November 14, 1997

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

*	Holding times
	GC/MS instrument performance check
*	Initial and continuing calibrations
*	Blanks
*	Surrogate recovery
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Internal standard performance
	Target compound identification
	Tentatively identified compounds
	Compound quantitation
	Reported detection limits
	System performance
*	Overall assessment of data for the SDG

CLP Inorganic Parameters

*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
	ICP interference check sample
	GFAA quality control
*	ICP serial dilution
	Sample result verification
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

*	Method compliance
*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
*	Surrogate recovery
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

TABLE 1
CURSORY DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	MS/MSD	Matrix Duplicates	LCS	Blanks	Calibrations	Internal Standards	Field Duplicates	Other
VOA	pg. 7	pg. 8	pg. 9	N/A	pg. 9	pg. 9-10	pg. 10-12	pg. 12	pg. 13	pg. 13
SVOA	√	√	pg. 15	N/A	pg. 15	pg. 15-16	pg. 16	√	N/A	pg. 17
Pesticide/PCB	pg. 18	√	pg. 18	N/A	pg. 18	√	pg. 19	N/A	N/A	√
Metals	√	N/A	√	√	√	pg. 21-22	√	N/A	pg. 23	pg. 23
TPHG	√	√	pg. 25	N/A	√	√	√	N/A	N/A	√
TPHE	√	√	pg. 27	N/A	pg. 27	√	√	N/A	N/A	√
Alkalinity	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfide	pg. 29	N/A	√	√	√	√	√	N/A	N/A	√
TOC	√	N/A	pg. 29-30	pg. 30	√	√	√	N/A	N/A	√
TDS	√	N/A	√	√	√	√	√	N/A	N/A	√
Bromide	√	N/A	√	√	√	√	√	N/A	N/A	√
Chloride	√	N/A	√	√	√	√	√	N/A	N/A	√
Fluoride	√	N/A	√	√	√	√	√	N/A	N/A	√
Sulfate	√	N/A	pg. 29-30	√	√	√	√	N/A	N/A	√
Phosphate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrate	√	N/A	√	√	√	√	√	N/A	N/A	√
Nitrite	√	N/A	√	√	√	√	√	N/A	N/A	√

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

TABLE 2
FULL DATA VALIDATION SUMMARY
Sample(s) 108-S22-004*, 108-S22-004RE*, 108-S02-009*, 108-S02-009DL*, 108-S22-003*, 108-S22-003RE, 108-S02-103*, and 108-S02-104*

Analysis	GC/MS Tuning	Target Compound List Identification	Compound or Analyte Quantification	Reported Detection Limits	Tentatively Identified Compounds	System Performance	Interference Check Sample	Graphite Furnace Quality Control
VOA	√	√	√	√	pg. 14	√	N/A	N/A
SVOA	√	√	√	√	pg. 17	√	N/A	N/A
Pesticide/PCB	√	√	√	√	N/A	√	N/A	N/A
Metals	N/A	√	√	√	N/A	N/A	√	√
TPHG	N/A	√	√	√	N/A	N/A	N/A	N/A
TPHE	N/A	√	√	√	N/A	N/A	N/A	N/A
Alkalinity	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfide	N/A	√	√	pg. 31	N/A	N/A	N/A	N/A
TOC	N/A	√	√	√	N/A	N/A	N/A	N/A
TDS	N/A	√	√	√	N/A	N/A	N/A	N/A
Bromide	N/A	√	√	√	N/A	N/A	N/A	N/A
Chloride	N/A	√	√	√	N/A	N/A	N/A	N/A
Fluoride	N/A	√	√	√	N/A	N/A	N/A	N/A
Sulfate	N/A	√	√	√	N/A	N/A	N/A	N/A
Phosphate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrate	N/A	√	√	√	N/A	N/A	N/A	N/A
Nitrite	N/A	√	√	√	N/A	N/A	N/A	N/A

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers found are described below.

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to grossly exceeded holding times, the following detected results are estimated and the nondetected results are rejected (Jh/Rh).

• All volatile compounds in samples	108-S02-016RE	108-S01-014RE
	108-S04-004RE	108-S00-100RE

The analysis holding time of 7 days for unpreserved waters was exceeded by 10 days in sample	108-S02-016RE	
The analysis holding time of 14 days for preserved waters was exceeded by 15 days in samples	108-S04-004RE	108-S01-014RE
The analysis holding time of 14 days for preserved waters was exceeded by 16 days in sample	108-S00-100RE	

B. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• All volatile compounds in samples	108-S02-016	108-S02-009DL*	108-S00-009RE
	108-S02-011	108-S07-002RE	108-S22-003RE
	108-S22-004RE	108-S09-003RE	108-S00-100

The analysis holding time of 7 days for unpreserved waters was exceeded by 7 days in samples	108-S02-016	108-S02-011
The analysis holding time of 14 days for preserved waters was exceeded by 3 days in sample	108-S22-004RE	
The analysis holding time of 14 days for preserved waters was exceeded by 5 days in sample	108-S02-009DL*	
The analysis holding time of 14 days for preserved waters was exceeded by 2 days in samples	108-S07-002RE 108-S09-003RE	108-S00-009RE 108-S22-003RE
The analysis holding time of 14 days for preserved waters was exceeded by 1 day in sample	108-S00-100	

II. Surrogate Recovery

A. Due to surrogate recovery problems, the following detected and nondetected results are qualified as estimated (Ja/UJa).

- All volatile compounds in samples 108-S07-002 108-S22-003*
  108-S09-003 108-S02-016RE

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S07-002	Bromofluorobenzene	67	80-120
108-S09-003	Bromofluorobenzene	79	80-120
108-S22-003*	Bromofluorobenzene	74	80-120
108-S02-016RE	Bromofluorobenzene	126	80-120
108-S02-016RE	1,2-Dichloroethane-d4	79	80-120

Low recoveries indicate that detected and nondetected results may be biased low.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in samples 108-S02-009* 108-S02-016

The surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S02-009*	1,2-Dichloroethane-d4	124	80-120
108-S02-016	1,2-Dichloroethane-d4	132	80-120

High percent recoveries indicate that detected results may be biased high.

C. The other surrogates outside of CLP limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S22-004*	1,2-Dichloroethane-d4	126	80-120
108-S00-009	1,2-Dichloroethane-d4	129	80-120
108-S00-009	Toluene-d8	122	80-120
108-S04-004	1,2-Dichloroethane-d4	129	80-120
108-S01-014	1,2-Dichloroethane-d4	129	80-120
108-S00-100	1,2-Dichloroethane-d4	128	80-120
108-S01-014RE	1,2-Dichloroethane-d4	123	80-120

Although the above listed percent recoveries demonstrate a high bias, the associated sample results were nondetected and therefore were not qualified.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD percent recoveries (%R) and relative percent differences (RPD) that did not meet the CLP limits are listed below.

The RPDs outside of the CLP Limits are listed below.

Sample ID	Compound	RPD	QC Limits
108-S16-001MS/MSD	2-Butanone	43	≤40
108-S16-001MS/MSD	1,2-Dichloroethane	21	≤20
108-S16-001MS/MSD	1,2-Dibromoethane	21	≤20

Since the individual MS/MSD percent recoveries were acceptable, no data required qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits with the exceptions listed below.

B. The RPDs outside of the QC Limits are listed below.

LCS ID	Compound	RPD	QC Limits
VBLKOSBS/BSD	Bromomethane	72	≤40
VBLKROBS/BSD	Bromomethane	71	≤40
VBLKROBS/BSD	1,1-Dichloroethane	73	≤40
VBLKROBS/BSD	Carbon disulfide	74	≤40
VBLKROBS/BSD	Methylene chloride	44	≤40
VBLKRPBS/BSD	Bromomethane	130	≤40
VBLKRPBS/BSD	Chloroethane	53	≤40
VBLKRPBS/BSD	1,1-Dichloroethene	44	≤40
VBLKRPBS/BSD	Carbon disulfide	46	≤40
VBLKRUBS/BSD	Bromomethane	163	≤40
VBLKRUBS/BSD	Chloroethane	76	≤40
VBLKRUBS/BSD	1,1-Dichloroethene	68	≤40
VBLKRUBS/BSD	Carbon disulfide	65	≤40
VBLKRUBS/BSD	2-Hexanone	106	≤40

Since the individual LCS recoveries were acceptable, no data required qualification.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Acetone in samples 108-S02-016 108-S02-016RE 108-S05-013

Acetone and Methylene chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks or field blanks.

VI. Calibrations

A. Due to initial calibration problems, the following detected and nondetected results are qualified as estimated (Jf/UJf).

• Bromomethane and 2-Hexanone in samples	108-S22-004*	108-S07-002
	108-S02-009*	108-S09-003
	108-S02-016	108-S00-009
	108-S16-001	108-S22-003*
	108-S16-002	
• 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone in samples	108-S22-004RE*	108-S05-013
	108-S02-009DL*	108-S05-014
	108-S02-016RE	108-S23-001
	108-S07-002RE	108-S00-010
	108-S09-003RE	108-S04-004
	108-S00-009RE	108-S01-014
	108-S22-003RE*	108-S00-100
	108-S02-011	

Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/19/97	Bromomethane	31.2
11/19/97	2-Hexanone	31.9
11/26/97	1,1-Dichloroethene	32.9
11/26/97	Acetone	52.9
11/26/97	Carbon disulfide	32.0
11/26/97	2-Hexanone	46.5

B. Due to initial calibration problems, the following detected results are estimated and the nondetected results are rejected (Jf/Rf).

• Acetone in samples	108-S22-004*	108-S16-001	108-S09-003
	108-S02-009*	108-S16-002	108-S00-009
	108-S02-016	108-S07-002	108-S22-003*
• 2-Butanone in samples	108-S22-004RE*	108-S00-009RE	108-S23-001
	108-S02-009DL*	108-S22-003RE*	108-S00-010
	108-S02-016RE	108-S02-011	108-S04-004
	108-S07-002RE	108-S05-013	108-S01-014
	108-S09-003RE	108-S05-014	108-S00-100

• Acetone and 2-Butanone in samples	108-S04-004RE	108-S01-014RE	108-S00-100RE

All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the following exceptions:

Calibration Date	Compound	RRF
11/19/97	Acetone	0.045
11/26/97	2-Butanone	0.040
12/11/97	Acetone	0.015
12/11/97	2-Butanone	0.028

C. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Acetone in samples	108-S22-004*	108-S02-016	108-S16-002
	108-S02-009*	108-S16-001	
• 2-Hexanone in samples	108-S22-004RE*	108-S02-011	108-S01-014
	108-S02-016RE	108-S05-013	108-S00-100
	108-S07-002RE	108-S05-014	108-S04-004RE
	108-S09-003RE	108-S23-001	108-S01-014RE
	108-S00-009RE	108-S00-010	108-S00-100RE
	108-S22-003RE*	108-S04-004	
• Carbon disulfide and 2-Hexanone in sample			108-S02-009DL*

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% with the following exceptions:

Calibration Date	Compound	%D
11/24/97	Acetone	40.0
11/26/97	2-Hexanone	41.3
11/28/97	2-Hexanone	59.4
11/28/97	Carbon disulfide	30.2
11/28/97	2-Hexanone	62.3
12/12/97	2-Hexanone	37.5

D. Due to continuing calibration problems, the following detected results are estimated and the nondetected results are rejected (Jf/Rf).

• Acetone and 2-Butanone in samples	108-S22-004*	108-S16-001	108-S01-014
	108-S02-009*	108-S16-002	108-S00-100
	108-S02-016	108-S04-004	
• Acetone in samples	108-S07-002	108-S00-009	108-S22-003*
	108-S09-003		

• 2-Butanone in samples	108-S22-004RE*	108-S00-009RE	108-S05-014
	108-S02-016RE	108-S22-003RE*	108-S23-001
	108-S07-002RE	108-S02-011	108-S00-010
	108-S09-003RE	108-S05-013	108-S02-009DL*
• Acetone, 2-Butanone, and 2-Hexanone in samples		108-S04-004RE	108-S00-100RE
		108-S01-014RE	

All of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	RRF
11/24/97	Acetone	0.027
11/24/97	2-Butanone	0.040
11/26/97	2-Butanone	0.032
11/25/97	Acetone	0.041
11/28/97 (VCB28)	Acetone	0.048
11/28/97 (VCB28)	2-Butanone	0.033
11/28/97 (VZB28)	2-Butanone	0.036
12/12/97	Acetone	0.016
12/12/97	2-Butanone	0.020
12/12/97	2-Hexanone	0.045

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time with the exceptions listed below.

B. Due to internal standard problems, the following nondetected results are qualified as estimated (UJe).

• Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene in sample 108-S00-100

The internal standard area counts in the samples listed above were less than one half of the reference standard and are listed below.

Sample	Internal Standard	Area	QC Limits
108-S00-100	1,2-Dichlorobenzene-d4	132574	141480-330120

Internal standard area counts of less than 50% of the standard area count may indicate a loss of instrument sensitivity.

VIII. Field Duplicate

A. No RPDs were outside of the QC limits for field duplicate samples 108-S16-001/108-S16-002.

B. The following RPDs were obtained for the field duplicate samples 108-S05-013/108-S05-014:

- 76% for Acetone

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

- Chlorobenzene in sample 108-S02-009*

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-S22-004*, 108-S22-004RE*, 108-S02-009*, 108-S02-009DL*, 108-S22-003*, and 108-S22-003RE*

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements were met for semivolatiles.

II. Surrogate Recovery

A. Surrogate recoveries were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable except for 4-Nitrophenol in the LCS SBLKCIBS/BSD, and therefore no data required qualification. Since the recoveries demonstrated a high bias and the associated sample results were nondetected, no data was qualified.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. The results obtained in the analysis of the LCS not within the control limits are shown below.

Sample ID	Compound	LCS %R	LCSD %R	QC Limits	RPD	QC Limits
SBLKCIBS/D	4-Nitrophenol	-	86	10-80	-	-

Although the above listed recoveries demonstrate a high bias, the associated samples results were nondetected and therefore were not qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Bis(2-ethylhexyl)phthalate in samples 108-S02-103*

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No results were qualified based on the method blank contamination and no field blanks were identified for semivolatile analysis in this SDG.

VI. Calibrations

A. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- 3-Nitroaniline and 2,4-Dinitrophenol in samples 108-S02-009* 108-S02-103*

Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the following exceptions:

Calibration Date	Compound	%RSD
11/7/97	3-Nitroaniline	34.8
11/7/97	2,4-Dinitrophenol	30.5

B. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

- 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, and Benzo(b)fluoranthene in samples 108-S02-009* 108-S02-103*

Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 with the following exceptions:

Calibration Date	Compound	%D
11/18/97	2,2'-Oxybis(1-chloropropane)	57.0
11/18/97	3-Nitroaniline	44.7
11/18/97	Benzo(b)fluoranthene	25.2

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. No field duplicates were identified in this SDG.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

Detected results reported below the CRQL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

Full Validation Criteria for Sample 108-S02-009* and 108-S02-103*

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. All chromatogram and quantitation reports were reviewed for compound identification. No semivolatile compounds were detected in samples 108-S02-009* and 108-S02-103*.

XII. Compound Quantitation and Reported Detection Limits

A. All chromatogram and quantitation reports were reviewed for compound quantitation. No semivolatile compounds were detected in samples 108-S02-009* and 108-S02-130*. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP PESTICIDE/PCB ANALYSIS

I. Holding Times

A. Due to holding time problems, the following nondetected results are qualified as estimated (UJh).

- All pesticide/PCB compounds in sample 108-S02-104*

The extraction holding time of 7 days for waters was exceeded by one day.

B. The 40 day analysis holding time was met.

II. Surrogate Recovery

A. Surrogate recoveries were within the 30-150% CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. The results obtained in the analysis of the LCS not within the control limits are shown below.

Sample ID	Compound	RPD	QC Limits
PBLKHBS/BSD	gamma-BHC	18	≤15
PBLKHBS/BSD	Dieldrin	21	≤18

Since the individual recoveries were within acceptance criteria no data required qualification.

V. Blank Contamination

A. No pesticide or PCB contaminants were found in the method blanks and no field blanks were identified for pesticide/PCB analysis in this SDG.

VI. Calibrations

A. A Resolution check mixture was analyzed at the beginning of the initial calibration sequence on each GC column. The resolution between adjacent peaks of target compounds was greater than or equal to 60% as required in the CLP SOW.

B. Performance evaluation mixtures (PEM) were analyzed at the proper frequency. The resolution between adjacent peaks was 90% on both GC columns. The absolute retention times for the initial and continuing PEMs were within the calculated retention time windows based on the three-point initial calibration.

C. The individual 4,4'-DDT and Endrin breakdowns were less than or equal to 20.0% and the combined breakdowns were less than or equal to 30.0% as required in the CLP SOW.

D. The relative percent differences (RPD) of amounts of each compound in PEMs were within the 25.0% CLP limits.

E. The initial calibration sequence was followed as required in the CLP SOW. Initial calibration of single and multicomponent compounds was performed for both columns at proper frequencies. The retention time windows were established according to the CLP SOW.

F. Due to initial calibration problems, the following nondetected results are qualified as estimated (UJf).

- alpha-BHC, Heptachlor, and Methoxychlor in sample 108-S02-104*

The percent relative standard deviations (%RSD) of calibration factors for single component compounds were within the 20.0% CLP limits with the following exceptions:

Calibration Date	Compound	%RSD
12/1/97	alpha-BHC	20.94
12/1/97	Heptachlor	22.16
12/1/97	Methoxychlor	20.64

The retention time windows were established according to the CLP SOW.

All required peaks for multicomponent compounds were present.

G. Continuing calibration sequence was followed as required in the CLP SOW. No more than 12 hours elapsed between continuing calibration analyses in an analytical sequence . The retention times (RT) of all compounds in Individual Mix and multicomponent standards were within CLP limits. The relative percent differences (RPD) of amount in Individual Mix standards were within the 25.0% CLP limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

*Full Validation Criteria for Sample 108-S02-104**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for sample 108-S02-104*.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run. The Interelement Correction Factor (IEC) was performed annually. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S22-004*	108-S16-002	108-S02-011	108-S23-001
	108-S02-009*	108-S07-002	108-S05-013	108-S04-004
	108-S02-016	108-S09-003	108-S05-014	108-S01-014
	108-S16-001	108-S22-003*		
• Antimony in samples	108-S22-004*	108-S22-003*	108-S05-013	108-S23-001
	108-S02-016	108-S02-011	108-S05-014	
• Arsenic in samples	108-S16-001	108-S09-003	108-S05-014	108-S04-004
	108-S16-002	108-S02-011	108-S23-001	108-S01-014
• Chromium in samples	108-S22-004*	108-S02-009*	108-S02-016	108-S02-011
• Nickel in samples	108-S16-001	108-S16-002		
• Silver in samples	108-S22-004*	108-S02-016	108-S04-004	108-S01-014
	108-S02-009*	108-S09-003		
• Vanadium in samples	108-S22-004*	108-S02-016	108-S16-002	108-S22-003*
	108-S02-009*	108-S16-001		
• Molybdenum in samples	108-S22-004*	108-S16-001	108-S02-011	108-S05-014
	108-S02-009*	108-S16-002	108-S05-013	108-S23-001
	108-S02-016	108-S22-003*		

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, µg/L
Aluminum	CCB	121.8
Antimony	CCB	9.0
Arsenic	CCB	2.4
Calcium	PB	20.60
Calcium	CCB	74.7
Chromium	PB	0.38
Chromium	CCB	1.0
Iron	PB	21.71
Iron	CCB	27.6
Lead	CCB	2.9
Magnesium	CCB	67.6
Manganese	PB	0.20
Manganese	CCB	2.0
Nickel	PB	0.6
Potassium	PB	66.66
Potassium	CCB	145.3
Silver	PB	0.36
Silver	CCB	0.9
Sodium	CCB	368.8
Vanadium	CCB	2.6
Molybdenum	CCB	1.2

Detected results less than 5x the maximum blank contamination were qualified.

B. No field blanks were identified for metals analysis in this SDG.

IV. Matrix Spike (MS)

A. Percent recoveries (%R) were within the 75-125% CLP limits.

V. Matrix Duplicate

A. Relative percent differences (RPD) were within the CLP limits of ≤10.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. The percent difference between the original sample result and the serial dilution result was within the QC limits of 10% for analyte concentrations greater than 50x the IDL.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S16-001/108-S16-002:

- 49% for Aluminum
- 64% for Zinc
- 26% for Molybdenum

The following RPDs were obtained for the field duplicate samples 108-S05-013/108-S05-014:

- 62% for Aluminum
- 200% for Arsenic
- 44% for Calcium
- 54% for Cobalt
- 27% for Magnesium
- 55% for Manganese
- 28% for Nickel
- 200% for Selenium
- 46% for Zinc

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

Full Validation Criteria for Samples 108-22-004*, 108-S02-009*, and 108-S22-003*

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. The analytical spike recovery results met the 85-115% QC limits.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL .

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met for TPHG.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed for this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and data did not require qualification.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks and no field blanks were identified for TPH gasoline analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S22-004 and 108-S22-003**

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-S22-004* and 108-S22-003*.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for unpreserved waters were met for TPHE.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike/matrix spike duplicate sample analyses were not performed in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable, except Diesel range organics in LCS PBLKJR/LCS/LCSD, and therefore no data required qualification. The Diesel range organics percent recovery demonstrated a low bias and all of the associated sample results were qualified as estimated.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits and the relative percent differences (RPD) were ≤50 with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

- Diesel range organics in samples 108-S22-004* 108-S22-003*

The result obtained in the analysis of the LCS was not within the control limits as shown below.

LCS ID	Compound	LCS % R	LCSD % R	QC Limits
PBLKJRLCS/LCSD	Diesel range organics	56	50	60-140

Detected results for Diesel range organics may be biased low and false nondetects may have been reported.

V. Blank Contamination

A. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks and no field blanks were identified for TPH extractables analysis in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S22-004* and 108-S22-003*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-S22-004* and 108-S22-003*.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic parameters were analyzed for; Alkalinity, Sulfide, Total dissolved solids, Bromide, Chloride, Fluoride, Sulfate, Phosphate, Nitrate, Nitrite, and Total organic carbon.

I. Holding Times

A. The 28 day analysis holding time requirement for Sulfate, Chloride, Bromide, Fluoride and Total organic carbon, 14 day analysis holding time requirements for Alkalinity, 7 day analysis holding time requirement for Total dissolved solids and Sulfide, and 2 day holding time requirement for Nitrate, Nitrite, and Phosphate were met with the exceptions listed below.

B. Due to holding time problems, the following detected and nondetected results are qualified as estimated (Jh/Rh).

- Sulfide in samples 108-S22-004* 108-S02-009*

The analysis holding time of 48 hours for unpreserved waters was exceeded by 2 days.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method. All Initial and Continuing calibration verification frequency percent recoveries (%R) were within the 90-110% QC limits.

B. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. No contaminant concentrations were found in the method blanks and no field blanks were identified for inorganic and physical analysis in this SDG.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

B. Due to accuracy problems in the MS analysis, the following detected and nondetected results are qualified as estimated (Jc/UJc).

- Total organic carbon in sample 108-S07-002

The recoveries that did not meet the QC limits are listed below.

Sample ID	Analyte	MS %R	MS %R	QC Limits
108-S07-002	Total organic carbon	-	63.4	75-125

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

C. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

- Sulfide in samples 108-S22-004*

The recoveries that did not meet the QC limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S22-004MS	Sulfide	166	75-125

Spike recoveries above 125% indicate that detected results may be biased high.

D. The relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

V. Matrix Duplicate

A. Matrix duplicate (DUP) analyses were reviewed for each matrix as applicable. All other relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exception listed below.

B. Due to precision problems in the matrix duplicate analysis, the following detected and nondetected results are qualified as estimated (Jd/UJd).

- Total organic carbon in sample 108-S07-002

The following analytes had relative percent differences (RPD) outside the ≤20 QC limits.

Duplicate Sample ID	Analyte	RPD
108-S07-002	Total organic carbon	46.2

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits and the relative percent differences (RPD) were within the laboratory established QC limits.

VII. Field Duplicate

A. There were no field duplicates identified in this SDG.

VIII. Other Qualifications

A. No other qualifications were required.

Full Validation Criteria for Samples 108-S22-004 and 108-S22-003**

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

The reported detection limits reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the following exceptions:

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP semivolatile analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable except for 4-Nitrophenol in the LCS SBLKCIBS/BSD, and therefore no data required qualification. Since the recoveries demonstrated a high bias and the associated sample results were nondetected, no data was qualified.

- Matrix spike/matrix spike duplicate sample analyses were not performed for CLP-pesticide/PCB analysis in this SDG. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable and data did not require qualification.

- Matrix spike/matrix spike duplicate sample analyses were not performed in this SDG for TPHE analysis. Although this is a protocol violation, the associated surrogate and LCS recoveries were acceptable, except Diesel range organics in LCS PBLKJR/LCS/LCSD, and therefore no data required qualification. The Diesel range organics percent recovery demonstrated a low bias and all of the associated sample results were qualified as estimated.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The laboratory reported detection limit for Sulfide was at 1.0 mg/L. The Tetra Tech EMI required reporting limit is 0.01 mg/L.

II. Usability

<u>CLP Volatile Organic Analysis</u>

A. Due to severe problems in the technical holding time exceedance and initial and continuing calibration RRFs in the volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound nondetected results were rejected in samples 108-S02-016RE, 108-S04-004RE, 108-S01-014RE, and 108-S00-100RE.

- Due to low RRFs in the initial calibration, Acetone nondetected results were rejected in 108-S22-004*, 108-S02-009*, 108-S02-016, 108-S16-001, 108-S16-002, 108-S07-002, 108-S09-003, 108-S00-009, and 108-S22-003*, 2-Butanone nondetected results were rejected in samples 108-S22-004RE*, 108-S02-009DL*, 108-S02-016RE, 108-S07-002RE, 108-S09-003RE, 108-S00-009RE, 108-S22-003RE*, 108-S02-011, 108-S05-013, 108-S05-014, 108-S23-001, 108-S00-010, 108-S04-004, 108-S01-014, and 108-S00-100, and Acetone and 2-Butanone nondetected results were

rejected in samples 108-S04-004RE, 108-S01-014RE, and 108-S00-100RE.

- Due to low RRFs in the continuing calibration, Acetone and 2-Butanone nondetected results were rejected in samples 108-S22-004*, 108-S02-009*, 108-S02-016, 108-S16-001, 108-S16-002, 108-S04-004, 108-S01-014, and 108-S00-100, Acetone nondetected results were rejected in samples 108-S07-002, 108-S09-003, 108-S00-009, and 108-S22-003*, 2-Butanone nondetected results were rejected in samples 108-S22-004RE*, 108-S02-016RE, 108-S07-002RE, 108-S09-003RE, 108-S00-009RE, 108-S22-003RE*, 108-S02-011, 108-S05-013, 108-S05-014, 108-S23-001, 108-S00-010, and 108-S02-009DL*, and Acetone, 2-Butanone, and 2-Hexanone nondetected results were rejected in samples 108-S04-004RE, 108-S01-014RE, and 108-S00-100RE

B. Due to technical holding time, instrument calibration, common laboratory contamination, surrogate recovery, internal standard, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all volatile compound detected results were qualified as estimated in four samples and all volatile compound results were estimated in nine samples.

- Due to initial calibration %RSD problems, Bromomethane and 2-Hexanone results were qualified as estimated in nine samples and 1,1-Dichloroethene, Acetone, Carbon disulfide, and 2-Hexanone results were qualified as estimated in fifteen samples.

- Due to initial calibration RRF problems, Acetone detected results were qualified as estimated in nine samples and 2-Butanone detected results were qualified as estimated in fifteen samples.

- Due to continuing calibration %D problems, Acetone results were qualified as estimated in five samples, 2-Hexanone results were qualified as estimated in eighteen samples, and Carbon disulfide results were estimated in one sample.

- Due to continuing calibration RRF problems, Acetone and 2-Butanone detected results were qualified as estimated in five.

- Due to common laboratory contamination, Acetone results were qualified nondetect in three samples.

- Due to surrogate recovery problems, all volatile compound results were qualified as estimated in four samples and all volatile compound detected results were qualified as estimated in two samples.

- Due to internal standard problems, Bromoform, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlobenzene, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene results were qualified as estimated in one sample.

- Due to compound quantitation problems, Chlorobenzene detected results were qualified as estimated in one sample.

- All tentatively identified compounds were qualified (NJ).

C. Sample 108-S02-009* was diluted due to sample results exceeding the calibration range and samples 108-S22-004*, 108-S02-016, 108-S07-002, 108-S09-003, 108-S00-009, 10-S22-003*, 108-S04-004, 108-S01-014, and 10-S00-100 were reanalyzed due to surrogate results exceeding the acceptance criteria. For sample 108-S02-009* all results except Chlorobenzene should be considered the most usable. The Chlorobenzene results for sample 108-S02-009DL* should be considered the most usable. The sample reanalyses 108-S22-004RE*, 108-S02-016RE, 108-S07-002RE, 108-S09-003RE, 108-S00-009RE, 10-S22-003RE*, 108-S04-004RE, 108-S01-014RE, and 10-S00-100RE were outside holding time and therefore the original analyses, 108-S22-004*, 108-S02-016, 108-S07-002, 108-S09-003, 108-S00-009, 10-S22-003*, 108-S04-004, 108-S01-014, and 10-S00-100 should be considered the most usable.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration and common laboratory contamination problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration %RSD problems, 3-Nitroaniline and 2,4-Dinitrophenol results were qualified as estimated in two samples.
- Due to continuing calibration problems, 2,2'-Oxybis(1-chloropropane), 3-Nitroaniline, and Benzo(b)fluoranthene results were qualified as estimated in two samples.
- Due to common laboratory contamination problems, Bis(2-ethylhexyl)phthalate results were qualified nondetect in one sample.
- All detected results reported below the CRQL were qualified as estimated.
- All tentatively identified compounds were qualified (NJ).

C. No samples were reextracted or reanalyzed for CLP semivolatile analysis in this SDG.

CLP Pesticide/PCB Analysis

A. No results for CLP pesticide/PCB analysis were rejected in this SDG.

B. Due to technical holding time exceedance and instrument calibration problems in the CLP pesticide/PCB analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, all pesticide/PCB compound results were qualified as estimated in one sample.
- Due to initial calibration problems, alpha-BHC, Heptachlor, and Methoxychlor results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for CLP pesticide/PCB analysis in this SDG.

CLP Metals Analysis

A. No results for CLP metals analysis were rejected in this SDG.

B. Due to calibration blank and method blank contamination problems in the metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to calibration blank and method blank contamination, Aluminum was qualified nondetect in fourteen samples, Antimony was qualified nondetect in seven samples, Arsenic was qualified nondetect in eight samples, Chromium was qualified nondetect in four samples, Nickel was qualified nondetect in two samples, Silver and Vanadium were qualified nondetect in six samples, and Molybdenum was qualified nondetect in ten samples.

- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. No samples were reextracted or reanalyzed for TPH gasoline analysis in this SDG.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to LCS problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:

- Due to LCS recovery problems, Diesel range organics results were qualified as estimated in two samples.

C. No samples were reextracted or reanalyzed for TPH extractable analysis in this SDG.

Non-CLP Inorganic and Physical Analysis

A. Due to severe problems in the technical holding time exceedance in the non-CLP inorganic and physical analysis, selected sample results were rejected. The findings were as follows:

- Due to technical holding time exceedance, Sulfide nondetected results were rejected in samples 108-S22-004* and 108-S02-009.

B. Due to technical holding time, MS, and DUP contamination problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance, Sulfide detected results were qualified as estimated in two samples.

- Due to MS recovery problems, Total organic carbon results were qualified as estimated in one sample and Sulfide detected results were qualified as estimated in one sample.

- Due to DUP precision problems, Total organic carbon results were qualified as estimated in one sample.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.

DATA VALIDATION REPORT ADDENDUM
MODIFICATIONS TO THE REPORT
AAW07

Prepared by: Nancy McDonald, Tetra Tech EM Inc.

Date: April 7, 1998

Analyses affected: CLP Volatiles, CLP Semivolatiles, TPH Gasoline, and TPH Extractables

The contract task order (CTO) number was incorrect on the front page of the data validation report. The correct CTO number is 069-108B01.

CLP Volatiles

1. Calibrations: Due to relative response factor (RRF) problems, detected results for acetone in samples 108-S01-021 and 108-S05-018 were qualified as estimated. Results for acetone in the other listed samples and 2-butanone in all samples were rejected.

2. Matrix spike/matrix spike duplicate (MS/MSD): The following MS/MSD recoveries and relative percent differences (RPD) were outside QC limits in sample 108-S01-020.

Analyte	MS (%R)	MSD (%R)	RPD	QC Limit
Vinyl chloride	0	27	314	60-140/20
Trichloroethene	-	-	28	20

No data qualifications were required because of the high concentrations of trichloroethene and vinyl chloride in the undiluted sample.

CLP Semivolatiles

1. Surrogate recovery: Recoveries of the surrogate terphenyl-d14 were biased low and outside QC limits in five samples. No data qualifications were required because only one base/neutral surrogate was outside QC limits. Surrogates were diluted out in the dilutions of three samples.

TPH Gasoline

1. TCL identification: Due to pattern match problems, the detected results for gasoline range organics in samples 108-S01-022 and 108-S01-027 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the gasoline standard used for calibration.

TPH Extractable Analysis

1. TCL Identification: Due to pattern match problems, the detected results for diesel range organics in samples 108-S01-022 and 108-S01-027 and motor oil range organics in samples 108-S01-020, 108-S01-022, and 108-S01-027 were qualified as estimated. The fuel patterns in the above samples did not show a reasonable match to the diesel or motor oil standards used for calibration.

Note: See usability section of the data validation report to determine which analytical run target analytes were reported from when reextraction, reanalyses, and dilutions were performed.

DATA VALIDATION REPORT

Site:	NAS Alameda
Contract Task Order (CTO) No.:	069-057B0401
Laboratory:	RCRA LabNet
Data Reviewer:	Richard Amano, Stacey Mavrakos, Erlinda Rauto, Dung Ngo, Pei Geng, Marci Lindsey, and Steve Ziliak.
Firm/Proj. No:	Laboratory Data Consultants, Inc./2694A
Review Date:	March 23 through March 24, 1998
Sample Delivery Group (SDG) No.:	AAW07

Sample Nos.:

108-S01-019	108-S00-011	108-S22-005	108-S01-017	108-S22-005DUP
108-S01-028	108-S07-007	108-S09-004	108-S01-018	108-S09-004MS
108-S01-020	108-S04-011	108-S00-012	108-S01-023	108-S09-004DUP
108-S01-020DL	108-S04-012	108-S01-027*	108-S01-020MS	108-S01-027MS
108-S01-022*	108-S04-010	108-S01-027DL*	108-S01-020MSD	108-S01-027DUP
108-S01-022DL*	108-S05-017	108-S01-016	108-S01-020DUP	108-S01-023MS
108-S01-022RE*	108-S05-018	108-S01-016DL	108-S22-005MS	108-S01-023DUP
108-S01-021				

* Full Validation Sample

Matrix:	Water
Collection Date(s):	January 28 through February 4, 1998

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (February 1994) and "USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review" (February 1994). In addition, the Tetra Tech EMI, Inc. documents "Data Validation Guidelines for CLP Organic Analyses," "Data Validation Guidelines for CLP Inorganic Analyses," "Data Validation Guidelines for Non-CLP Organic Analyses," "Data Validation Guidelines for Non-CLP Inorganic and Physical Analyses" (September 1996), and the document entitled "PRC Comprehensive Long-term Environmental Action Navy II Analytical Services Statement of Work" (June 1995) were used along with other specified criteria in EPA methods. Data validation requirements are presented below.

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

_____

Certified by Richard Amano
Principal Chemist

DATA VALIDATION REQUIREMENTS

Full validation includes all parameters listed below. Cursory validation parameters are indicated by an asterisk (*).

CLP Organic Parameters

*	Holding times
	GC/MS instrument performance check
*	Initial and continuing calibrations
*	Blanks
*	Surrogate recovery
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Internal standard performance
	Target compound identification
	Tentatively identified compounds
	Compound quantitation
	Reported detection limits
	System performance
*	Overall assessment of data for the SDG

CLP Inorganic Parameters

*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
	ICP interference check sample
	GFAA quality control
*	ICP serial dilution
	Sample result verification
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

Non-CLP Organic and Inorganic Parameters

*	Method compliance
*	Holding times
*	Initial and continuing calibrations
*	Blanks
*	Matrix spike/matrix spike duplicate
*	Laboratory control sample or blank spike
*	Field duplicates
*	Matrix duplicates
*	Surrogate recovery
	Analyte quantitation
	Reported detection limits
*	Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination, Field blank contamination

c Matrix spike/laboratory control sample (LCS) recovery exceedance

d Duplicate precision exceedance

e Internal standard exceedance

f Calibration exceedance

g Quantification below reporting limit

h Other qualifications

TABLE 1
SAMPLE CROSS REFERENCE TABLE
SAMPLE DELIVERY GROUP AAW07

Sample ID	Matrix	Date Collected	Quality Control ID	Validation Criteria*	Analyses														
					ALKALINITY	CHLORIDE	SULFATE	NITRATE	NITRITE	O-PO4	BROMIDE	FLUORIDE	TDS	SULFIDE	SVOC	METALS	TEPH	TPPH	VOC
108-S00-011	Water	2/3/98	Trip blank																X
108-S00-012	Water	1/28/98	Trip blank																X
108-S01-016	Water	2/4/98			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-017	Water	2/4/98			X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-018	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-019	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S01-020	Water	2/3/98	MS/MSDDUP**		X	X	X	X	X	X	X	X	X	X	X**	X**	X**	X**	X**
108-S01-021	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X	X	X	X
108-S01-022	Water	2/3/98		Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-023	Water	2/4/98	MS/DUP**		X	X	X	X	X	X	X	X	X	X	X	X			X
108-S01-027	Water	2/4/98	MS/DUP**	Full	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108-S01-028	Water	2/3/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-010	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-011	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S04-012	Water	2/4/98	Duplicate of sample 108-S04-011													X			X
108-S05-017	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S05-018	Water	2/4/98	Duplicate of sample 108-S05-017													X			X
108-S07-007	Water	2/4/98			X	X	X	X	X	X	X	X	X	X		X			X
108-S09-004	Water	2/4/98	MS/DUP**		X	X	X	X	X	X	X	X	X	X		X			X
108-S22-005	Water	2/4/98	MS/DUP**		X	X	X	X	X	X	X	X	X	X		X**	X	X	X

* = Cursory validation performed on all samples
MS/MSD = Matrix Spike/Matrix Spike Duplicate
DUP = Matrix duplicate
SVOC = Semivolatile Organic Compounds
TPPH = Total purgeable Petroleum Hydrocarbons
TOC = Total Organic Carbon
TDS = Total Dissolved solids

*** = Full review performed on indicated parameters only
** = MS/MSD/DUP performed on indicated parameters only
VOC = Volatile Organic Compounds
OP/PCB = Organochlorine Pesticides/Polychlorinated Biphenyls
TEPH = Total Extractable Petroleum Hydrocarbons
O-PO4 = Orthophosphate as Phosphorus

DATA ASSESSMENT

CLP VOLATILE ORGANIC ANALYSIS

I. Holding Times

A. Due to holding time problems, the following nondetected results are qualified as estimated (UJh).

- All volatile compounds in sample 108-S00-012

The analysis holding time of 14 days was exceeded by 1 day in the sample listed above.

II. Surrogate Recovery

A. The surrogate percent recoveries (%R) were within the CLP limits with the exception listed below.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- All volatile compounds in sample 108-S01-022*

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S01-022*	Toluene-d8	153	80-120%

High percent recoveries indicate that detected results may be biased high.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A The MS/MSD was performed on sample 108-S01-020. The percent recoveries (%R) and relative percent differences (RPD) were within the CLP limits.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) and relative percent differences (RPD) were evaluated against CLP MS/MSD criteria and were within the QC limits with the exceptions listed below.

B. The result obtained in the analysis of the LCS which was not within the control limits is shown below.

LCS ID	Compound	RPD	QC Limits
VBLKEJBS/BSD	Vinyl chloride	25	≤20
VBLKEJBS/BSD	1,2-Dichloroethane	32	≤20
VBLKEJBS/BSD	Carbon tetrachloride	29	≤20
VBLKEJBS/BSD	1,2-Dichloropropane	23	≤20
VBLKEJBS/BSD	Trichloroethene	23	≤20
VBLKEJBS/BSD	1,1,2-Trichloroethane	26	≤20
VBLKEJBS/BSD	Benzene	24	≤20
VBLKEJBS/BSD	cis-1,3-Dichloropropene	27	≤20
VBLKEJBS/BSD	Bromoform	28	≤20
VBLKEJBS/BSD	Tetrachloroethene	26	≤20
VBLKEJBS/BSD	1,2-Dibromoethane	26	≤20
VBLKEJBS/BSD	1,4-Dichlorobenzene	26	≤20

Since the individual percent recoveries were within the QC limits, no data was qualified.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

- Acetone in samples 108-S05-018 108-S01-021

Acetone and Methylene Chloride are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks and the trip blank samples 108-S00-011 and 108-S00-012.

VI. Calibrations

A. Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all volatile compounds and all of the initial calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the exceptions listed below.

B. Due to severe initial calibration problems, the following detected results are estimated and the nondetected results are rejected (Jf/Rf).

- Acetone and 2-Butanone in samples

108-S01-019	108-S07-007	108-S00-012
108-S01-028	108-S04-011	108-S01-027*
108-S01-020	108-S04-012	108-S01-027DL*
108-S01-020DL	108-S04-010	108-S01-016
108-S01-022*	108-S05-017	108-S01-017
108-S01-022DL*	108-S05-018	108-S01-018
108-S01-021	108-S22-005	108-S01-023
108-S00-011	108-S09-004	

The relative response factor which did not meet the QC limit of ≥ 0.05 are listed below.

Calibration Date	Compound	RRF
1/12/98	Acetone	0.014
1/12/98	2-Butanone	0.028

C. Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% . All of the continuing calibration RRF values were greater than or equal to 0.05 for all volatile compounds with the exception listed below.

D. Due to severe continuing calibration problems, the following detected results are estimated and the nondetected results are rejected (Jf/Rf).

• Acetone and 2-Butanone in samples	108-S01-019	108-S07-007	108-S00-012
	108-S01-028	108-S04-011	108-S01-027*
	108-S01-020	108-S04-012	108-S01-027DL*
	108-S01-020DL	108-S04-010	108-S01-016
	108-S01-022*	108-S05-017	108-S01-017
	108-S01-022DL*	108-S05-018	108-S01-018
	108-S01-021	108-S22-005	108-S01-023
	108-S00-011	108-S09-004	

The relative response factor which did not meet the QC limit of ≥ 0.05 are listed below.

Calibration Date	Compound	RRF
2/10/98 (YA210)	Acetone	0.013
2/10/98 (YA210)	2-Butanone	0.028
2/16/98	Acetone	0.015
2/16/98	2-Butanone	0.029
2/12/98	Acetone	0.017
2/12/98	2-Butanone	0.032
2/10/98 (YB210)	Acetone	0.015
2/10/98 (YB210)	2-Butanone	0.030

E. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• Chloromethane in samples	108-S00-011	108-S01-028	108-S01-022*	108-S07-007
	108-S01-019	108-S01-020DL	108-S01-021	108-S04-011
• Chloromethane and Bromomethane in samples	108-S01-020	108-S04-010	108-S22-005	108-S00-012
	108-S01-022DL*	108-S05-017	108-S09-004	108-S01-027*
	108-S04-012	108-S05-018		

The following continuing calibrations had percent differences (%D) of ≥25% .

Calibration Date	Compound	%D
2/10/98 (YA210)	Chloromethane	32.9
2/12/98	Chloromethane	33.7
2/12/98	Bromomethane	29.9
2/10/98 (YB210)	Chloromethane	27.6

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S05-017/108-S05-018:

- 200% for Vinyl chloride
- 200% for Acetone
- 200% for Chloroform
- 200% for Toluene

No results were detected in the field duplicate samples 108-S04-011/108-S04-012.

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. No results were reported below the CRQL.

B. The following detected results are qualified as estimated (Jh).

- Vinyl chloride and cis-1,2-Dichloroethene in sample 108-S01-020
- Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylene, and cis-1,2-Dichloroethene in sample 108-S01-022*
- Toluene in sample 108-S01-027*

The above listed sample results exceeded the calibration range.

X. GC/MS Tuning

A. The ion abundance criteria were met for the bromofluorobenzene (BFB) GC/MS performance check. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reported results reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP SEMIVOLATILE ORGANIC ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for waters were met.

II. Surrogate Recovery

A. Surrogate percent recoveries (%R) were within CLP limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD was performed on sample 108-S01-020. The percent recoveries (%R) and relative percent differences (RPD) were within the CLP limits with the exceptions listed below.

B. The recoveries that did not meet the QC limits are listed below.

Sample ID	Compound	MS %R	MSD %R	QC Limits
108-S01-020	4-Nitrophenol	103	89	10-80

Although the above listed MS/MSD recoveries demonstrate a high bias, all associated sample results were nondetected and therefore were not qaulified.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Although LCS QC samples are not required under the CLP SOW, the laboratory performed the analysis of those QC samples. The percent recoveries (%R) were evaluated against CLP MS/MSD criteria and were within the QC limits.

V. Blank Contamination

A. Due to common laboratory contamination, the following results are considered nondetected (UJb).

• Diethylphthalate in samples	108-S01-022*	108-S01-027*
• Bis(2-ethylhexyl)phthalate in samples	108-S01-020	108-S01-016
	108-S01-027*	108-S01-023
• Di-n-octylphthalate in samples	108-S01-020	108-S01-023

Dimethylphthalate, Diethylphthalate, Di-n-butylphthalate, Butylbenzylphthalate, Bis(2-Ethylhexyl)phthalate, and Di-n-octylphthalate are considered common laboratory contaminants when found at levels less than 5x the CRQL in environmental samples and not found in the associated blanks.

B. No volatile contaminants were found in the method blanks.

C. No field blanks were identified in this SDG.

VI. Calibrations

A. Initial calibration was performed using required CLP standard concentrations. Percent relative standard deviations (%RSD) were less than or equal to 30.0% and average relative response factors (RRF) were greater than or equal to 0.05 for all semivolatile compounds with the exceptions listed below.

B. Due to initial calibration problems, the following nondetected results are estimated (UJf).

• 3-Nitroaniline and 4-Nitroaniline in samples	108-S01-020	108-S01-027*	108-S01-016DL
	108-S01-022*	108-S01-027DL*	108-S01-017
	108-S01-022DL*	108-S01-016	108-S01-023

The following initial calibrations had percent relative standard deviations (%RSD) of ≥30%.

Calibration Date	Compound	%RSD
1/23/98	3-Nitroaniline	38.4
1/23/98	4-Nitroaniline	31.1

C. Continuing calibration was performed at the required frequencies in the CLP SOW. All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% and all of the continuing calibration RRF values were greater than or equal to 0.05 for all semivolatile compounds with the exception listed below.

D. Due to continuing calibration problems, the following nondetected results are qualified as estimated (UJf).

• 4-Chloroaniline, 4-Nitrophenol, and 4-Nitroaniline in samples	108-S01-022*	108-S01-016
	108-S01-027*	108-S01-017
• 4-Chloroaniline, 3-Nitroaniline, 2,4-Dinitrophenol, and Dibenz(a,h)anthracene in samples	108-S01-020	108-S01-016DL
	108-S01-022DL*	108-S01-023
	108-S01-027DL*	

The following continuing calibrations had percent differences (%D) of ≥25% .

Calibration Date	Compound	%D
2/11/98	4-Chloroaniline	75.1
2/11/98	4-Nitrophenol	44.2
2/11/98	4-Nitroaniline	30.7
2/12/98	4-Chloroaniline	35.2
2/12/98	3-Nitroaniline	36.5
2/12/98	2,4-Dinitrophenol	31.4
2/12/98	Dibenz(a,h)anthracene	29.4

VII. Internal Standards

A. All internal standard area counts were within -50% to +100% of the associated calibration standard and retention times were ±30 seconds of the associated calibration standard retention time.

VIII. Field Duplicate

A. No field duplicates were identified in this SDG.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP SVOA detected results reported below the CRQL

B. The following detected results are qualified as estimated (Jh).

- 2,4-Dimethylphenol in samples — 108-S01-022*, 108-S01-027*
- Naphthalene in sample — 108-S01-016

The above listed sample results exceeded the calibration range.

Full Validation Criteria for Samples 108-S01-022*, 108-S01-022DL*, 108-S01-027*, and 108-S01-027DL*

X. GC/MS Tuning

A. The ion abundance criteria were met for the decafluorotriphenylphosphine (DFTPP) GC/MS performance checks. The samples were analyzed within 12 hours of the associated performance check.

XI. Target Compound List (TCL) Identification

A. The relative retention times, mass spectra, and peak identifications of the samples were evaluated. Target compound identification was considered to be correct.

XII. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reported results reflect any dilutions, weights, volumes, and percent moisture.

XIII. Tentatively Identified Compounds (TICs)

A. The sample spectra and library searches were evaluated. TIC results were recalculated and found to be correct. All identified compounds were reported with the "NJ" qualifier.

XIV. System Performance

A. The samples were evaluated for reconstructed ion chromatogram (RIC) baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

CLP METALS ANALYSIS

I. Holding Times

A. The 6 month and 28 day holding time requirements were met for CLP TAL Metals (including Molybdenum) and Mercury, respectively.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used in accordance with the CLP SOW.

B. All initial and continuing calibration verifications (ICV and CCV) recoveries were within the 90-110% CLP Limits (80-120% for Mercury). CRDL Standards for ICP and AA were analyzed with each analytical run and recoveries were ≥75% . Although the Interelement Correction Factor (IEC) was not performed annually for all ICP analytes, the Instrument Detection Limit (IDL) was not analyzed quarterly for all analytes, and the Linear Range Analysis (LRA) was not analyzed quarterly for all ICP and ICP Trace analytes, the exceeded time difference was not found to be significant and therefore no data required qualification. The Instrument Detection Limit (IDL) and Linear Range Analysis (LRA) were analyzed quarterly for all other analytes.

C. Due to calibration problems, the following detected and nondetected results are qualified as estimated (Jf/UJf).

• Iron in samples	108-S01-021	108-S22-005
	108-S07-007	108-S09-004
	108-S04-011	108-S01-027*
	108-S04-012	108-S01-016
	108-S04-010	108-S01-017
	108-S05-017	108-S01-018
	108-S05-018	108-S01-023
• Copper in sample	108-S04-010	

The CRDL standard percent recoveries for Iron were 74.5%, 74.8, and 71.3, outside the control limits of 75-125%. The CRDL standard percent recoveries for Copper was -21.9, outside the control limits of 75-125%.

III. Blank Contamination

A. Due to calibration and method blank contamination, the following results are considered nondetected (UJb).

• Aluminum in samples	108-S01-019	108-S05-017
	108-S01-028	108-S05-018
	108-S01-020	108-S22-005
	108-S01-022*	108-S09-004
	108-S01-021	108-S01-016
	108-S07-007	108-S01-017
	108-S04-011	108-S01-018
	108-S04-012	108-S01-023
	108-S04-010	
• Antimony in sample	108-S01-028	108-S04-010
	108-S01-020	108-S05-017
	108-S01-021	108-S09-004
	108-S07-007	108-S01-016
	108-S04-011	108-S01-023
	108-S04-012	
• Arsenic in samples	108-S01-021	108-S05-017
	108-S07-007	108-S05-018
	108-S04-011	108-S09-004
	108-S04-012	108-S01-016
	108-S04-010	108-S01-018
• Chromium in samples	108-S01-028	108-S01-027*
	108-S01-020	108-S01-016
	108-S01-022*	
• Copper in samples	108-S01-028	108-S05-018
	108-S01-020	108-S22-005
	108-S01-021	108-S09-004
	108-S07-007	108-S01-016
	108-S05-017	108-S01-017
• Iron in samples	108-S01-019	108-S05-017
	108-S01-028	108-S05-018
	108-S01-021	108-S01-016
	108-S07-007	108-S01-023
• Lead in samples	108-S01-020	108-S01-017
	108-S01-016	
• Selenium in samples	108-S01-021	108-S05-017
	108-S07-007	108-S05-018
	108-S04-011	108-S22-005
	108-S04-010	
• Vanadium in samples	108-S01-028	108-S22-005
	108-S01-020	108-S01-016
• Zinc in samples	108-S01-019	108-S01-027*

108-S01-028	108-S01-016
108-S01-022*	108-S01-017
108-S01-021	108-S01-018
108-S22-005	108-S01-023
108-S09-004	

The following metals were detected in the associated calibration and method blanks at the concentrations noted below.

Analyte	Blank ID	Concentration, ug/L
Aluminum	CCB	46.5
Antimony	CCB	4.7
Arsenic	CCB	2.6
Barium	PB	0.14
Beryllium	CCB	0.2
Calcium	CCB	80.7
Chromium	CCB	0.6
Copper	CCB	-12.0
Iron	CCB	730.5
Lead	CCB	-2.1
Magnesium	CCB	75.5
Manganese	CCB	1.7
Potassium	PB	66.42
Selenium	CCB	-2.0
Sodium	CCB	-247.6
Vanadium	CCB	2.0
Zinc	CCB	16.2

Detected results less than 5x the maximum blank contamination were qualified.

B. No field blanks were identified in this SDG.

IV. Matrix Spike (MS)

A. The matrix spike was performed on samples 108-S01-020 and 108-S22-005 for all ICP Metals and Mercury. Percent recoveries (%R) were within the 75-125% CLP limits with the exceptions listed below.

B. Due to accuracy problems in the MS analysis, the following detected and nondetected results are qualified as estimated (Jc/UJc).

• Lead in samples	108-S01-019	108-S04-011	108-S09-004
	108-S01-028	108-S04-012	108-S01-027*
	108-S01-020	108-S04-010	108-S01-016
	108-S01-022*	108-S05-017	108-S01-017
	108-S01-021	108-S05-018	108-S01-018
	108-S07-007	108-S22-005	108-S01-023

The recoveries that did not meet the QC limits are listed below.

Sample ID	Analyte	%R	QC Limits
08-S01-020MS	Lead	72.0	75-125%

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

C. Post spike sample analysis was performed as required by the method. All recoveries were within the 75-125% QC limits.

V. Matrix Duplicate

A. The DUP was performed on samples 108-S01-020 and 108-S22-005 for all ICP metals and Mercury. Relative percent differences (RPD) were within the CLP limits of ≤20 for waters and ≤35 for soils with the exceptions listed below.

B. Due to precision problems in the matrix duplicate analysis, the following detected and nondetected results are qualified as estimated (Jd/UJd).

• Lead in samples	108-S01-019	108-S04-011	108-S09-004
	108-S01-028	108-S04-012	108-S01-027*
	108-S01-020	108-S04-010	108-S01-016
	108-S01-022*	108-S05-017	108-S01-017
	108-S01-021	108-S05-018	108-S01-018
	108-S07-007	108-S22-005	108-S01-023

The following analytes had differences outside the QC limits.

Sample ID	Analyte	Difference	QC Limits
108-S01-020DUP	Lead	1.8 ug/L	≤1.5

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% CLP limits.

VII. ICP Serial Dilution

A. Sample 108-S01-020 was used for the ICP serial dilution analysis.

B. Due to ICP serial dilution problems, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• Copper and Potassium in samples	108-S01-019	108-S04-011	108-S09-004

108-S01-028	108-S04-012	108-S01-027*
108-S01-020	108-S04-010	108-S01-016
108-S01-022*	108-S05-017	108-S01-017
108-S01-021	108-S05-018	108-S01-018
108-S07-007	108-S22-005	108-S01-023

The percent difference between the original sample result and the serial dilution result was outside the QC limits of 10% for analyte concentrations greater than 50x the IDL as shown below.

Sample ID	Analyte	Original Concentration	50x IDL	%D
108-S01-020	Copper	35.69 ug/L	35 ug/L	19.0
108-S01-020	Potassium	38252 ug/L	370 ug/L	17.9

VIII. Field Duplicate

A. The following RPDs were obtained for the field duplicate samples 108-S04-011 and 108-S04-012:

- 47% for Aluminum
- 86 % for Arsenic.
- 64% for Cobalt

B. The following RPDs were obtained for the field duplicate samples 108-S05-017 and 108-S05-018.

- 200% for Antimony
- 80 % for Arsenic.
- 38% for Selenium

For water samples, the field RPD guideline is ± 25%. The data are not qualified on the basis of field duplicate results.

IX. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All CLP metals results above the IDL but below the CRDL.

Results above the IDL but below the CRDL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.

X. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and reflect any dilutions, weights, volumes, and percent moisture.

XI. Graphite Furnace Atomic Absorption (GFAA) Analysis

A. The analytical spike recovery results met the 85-115% QC limits.

XII. ICP Interference Check Sample

A. The ICP response of analytes not spiked in the Interference Check Standard A (ICSA) solution were reviewed for spectral interference. The absolute values of all analytes were ≤ IDL.

B. Molybdenum was not spiked in the ICS for samples 108-S01-022* and 108-S01-027*.

TPH GASOLINE (TPHG) ANALYSIS

I. Holding Times

A. The 14 day analysis holding time requirements for preserved waters were met.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 75-125% QC limits with the exceptions listed below.

B. Due to surrogate recovery problems, the following detected results are qualified as estimated (Ja).

- TPH gasoline in samples 108-S01-022* 108-S01-022RE*

The surrogates outside of QC limits are listed below.

Sample ID	Surrogate	% R	QC Limits
108-S01-022*	4-Bromofluorobenzene	146	75-125%
108-S01-022RE*	4-Bromofluorobenzene	142	75-125%

High percent recoveries indicate that detected results may be biased high.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. Matrix spike and matrix spike duplicate sample analysis was performed on sample 108-S01-020. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the QC limits.

V. Blank Contamination

A. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks. No field blanks were identified in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No results were reported below the RL.

Full Validation Criteria for Samples 108-S01-022*, 108-S02-022RE*, and 108-S01-027*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and the reported sample results reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for samples 108-S01-022*, 108-S02-022RE*, and 108-S01-027*.

TPH EXTRACTABLE (TPHE) ANALYSIS

I. Holding Times

A. The 7 day extraction and 40 day analysis holding time requirements for unpreserved waters were met.

II. Surrogate Recovery

A. All surrogate recoveries (%R) were within the 60-140% QC limits.

III. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. The MS/MSD was performed on sample 108-S01-020. The percent recoveries (%R) and relative percent differences (RPD) were within the QC limits.

IV. Blank Spike or Laboratory Control Sample (LCS)

A. Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within the 60-140% QC limits were within the ≤50 QC limits with the exceptions listed below.

B. Due to a problem in the LCS analysis, the following detected and nondetected results are qualified as estimated (Jh/UJh).

• TPH extractables in samples	108-S01-020	108-S22-005
	108-S01-022*	108-S01-027*
	108-S01-021	

The result obtained in the analysis of the LCS which was not within the control limits is shown below.

LCS ID	Compound	LCS %R	LCSD %R	QC Limits
PBLKDPBS	TPH as diesel	54	-	60-140%
PBLKEGBS/BSD	TPH as diesel	42	48	60-140%
PBLKEGBSRE/BSDRE	TPH as diesel	42	49	60-140%

V. Blank Contamination

A. No TPHE contaminants were found in the method blanks. No field blanks were identified in this SDG.

VI. Calibrations

A. Initial calibration of compounds was performed as required by the method. The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

B. Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All TPH extractable detected results reported below the RL

Full Validation Criteria for Samples 108-S01-022* and 108-S01-027*

IX. Compound Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated. The reported detection limits were consistent with Tetra Tech EMI's required report limits and the reported sample results reflect any dilutions, weights, volumes, and percent moisture.

X. System Performance

A. The samples were evaluated for baseline shifts, extraneous peaks, loss of resolution, and peak tailing. No system degradation was noted.

XI. Compound Identification

A. Target compound identification was considered to be correct for sample 108-S01-022* and 108-S01-027*.

NON-CLP INORGANIC AND PHYSICAL ANALYSIS

The following non-CLP inorganic and physical parameters were analyzed for Bromide, Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, Orthophosphate ($O\text{-}PO_4$), Alkalinity, Fluoride, Sulfide, and Total dissolved solids (TDS).

I. Holding Times

A. The 28 day analysis holding time requirement for Chloride, Sulfate, Conductivity, and Sulfide, the 24 hour analysis holding time requirement for pH, the 48 hour analysis holding time requirement for Nitrate, Nitrite, and $O\text{-}PO_4$, the 14 day analysis holding time requirements for Alkalinity, and the 7 day analysis holding time requirements for TDS were met.

B. Due to holding time problems, the following detected results are qualified as estimated (Jh).

- Total dissolved solids in samples 108-S07-007, 108-S05-017, 108-S04-011, 108-S09-004, 108-S04-010

The analysis holding time of 7 days was exceeded by 1 day for the samples listed above.

II. Calibrations

A. All instruments were calibrated daily and the proper number of standards were used as required by the method.

B. All Initial and Continuing calibration verification were performed at the proper frequency and percent recoveries (%R) were within the 90-110% QC limits. All initial calibration correlation coefficients were ≥ to 0.995 .

III. Blank Contamination

A. No contaminant concentrations were found in the method blanks. No field blanks were identified in this SDG.

IV. Matrix Spike (MS)

A. Matrix spike (MS) and matrix spike duplicate (MSD) analyses were performed on samples 108-S01-022* and 108-S01-027*. Percent recoveries (%R) were within the 75-125% QC limits and relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses with the exceptions listed below.

B. Due to accuracy problems in the MS analysis, the following detected results are qualified as estimated (Jc).

• Bromide in samples	108-S01-019	108-S04-011	108-S01-027*
	108-S01-028	108-S04-010	108-S01-016
	108-S01-020	108-S05-017	108-S01-017
	108-S01-022*	108-S22-005	108-S01-018
	108-S01-021	108-S09-004	108-S01-023
	108-S07-007		

The recoveries that did not meet the QC limits are listed below.

Sample ID	Analyte	%R	QC Limits
108-S09-004MS	Bromide	67.5	85-115%

Spike recoveries between 30-74% indicate that detects may be biased low and false nondetects may have been reported.

V. Matrix Duplicate

A. Matrix duplicate (DUP) sample analysis was performed on samples 108-S01-022* and 108-S01-027*. Relative percent differences (RPD) were within the ≤20% QC limits for inorganic analyses and the ≤10% QC limits for physical analyses.

VI. Laboratory Control Sample (LCS)

A. Percent recoveries (%R) were within the 80-120% QC limits.

VII. Field Duplicate

A. No field duplicates were identified in this SDG.

VIII. Other Qualifications

A. No results were reported below the RLs.

Full Validation Criteria for Samples 155W96GW1* and 155W96GW1DL*

VIII. Analyte Quantitation and Reported Detection Limits

A. Sample results were recalculated, with the proper dilution factors, weights, volumes, and percent moisture used to calculate the sample results. The samples were found to be correctly quantitated.

The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The MDL was reported at 1.0 mg/L for Sulfide and 0.1 mg/L for O-PO_4. The MDL should be ≤ the CRDL which is 0.01 mg/L for Sulfide and 0.05 mg/L for O-PO_4.

The reported sample results reflect any dilutions, weights, volumes, and percent moisture.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

A. All analyses were conducted within all specifications of the requested methods with the exceptions listed below.

- The reported detection limits were not consistent with Tetra Tech EMI's required report limits. The MDL was reported at 1.0 mg/L for Sulfide and 0.1 mg/L for O-PO_4. The MDL should be ≤ the CRDL which is 0.01 mg/L for Sulfide and 0.05 mg/L for O-PO_4.

II. Usability

CLP Volatile Organic Analysis

A. Due to severe problems in the instrument calibration in the CLP volatile analysis, selected sample results were rejected. The findings were as follows:

- Due to initial and continuing calibration RRF problems, Acetone and 2-Butanone nondetected results were rejected in samples 108-S01-019, 108-S01-028, 108-S01-020, 108-S01-020DL, 108-S01-022*, 108-S01-022DL*, 108-S01-021, 108-S00-011, 108-S07-007, 108-S04-011, 108-S04-012, 108-S04-010, 108-S05-017, 108-S05-018, 108-S22-005, 108-S09-004, 108-S00-012, 108-S01-027*, 108-S01-027DL*, 108-S01-016, 108-S01-017, 108-S01-018, and 108-S01-023.

B. Due to technical holding time exceedance, instrument calibration, common laboratory contamination, surrogate, and compound quantitation problems in the volatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time exceedance problems, all volatile results were qualified as estimated in one sample.
- Due to initial and continuing calibration RRF problems, Acetone and 2-Butanone detected results were qualified as estimated in twenty-three samples.
- Due to continuing calibration %D problems, Chloromethane nondetected results were qualified as estimated in eighteen samples and Bromomethane nondetected results were qualified as estimated in ten samples.
- Due to common laboratory contamination problems, Acetone was qualified nondetected in two samples.
- Due to surrogate recovery problems, all volatile detected results were qualified as estimated in one sample.
- Due to compound quantitation problems, Vinyl chloride, cis-1,2-Dichloroethene, and Toluene detected results were qualified as estimated in two samples and Benzene, Chlorobenzene, Ethylbenzene, and Xylene detected results were qualified as estimated in one sample.

- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S01-020, 108-S01-022*, and 108-S01-027 were diluted due to sample results exceeding the calibration range. For sample 108-S01-020, all volatile results except Vinyl chloride and cis-1,2-Dichloroethene should be considered the most usable. The Vinyl chloride and cis-1,2-Dichloroethene results for sample 108-S01-020DL should be considered the most usable. For sample 108-S01-022*, all volatile results except Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylene, and cis-1,2-Dichloroethene should be considered the most usable. The Vinyl chloride, Benzene, Toluene, Chlorobenzene, Ethylbenzene, Xylene, and cis-1,2-Dichloroethene results for sample 108-S01-022DL* should be considered the most usable. For sample 108-S01-027, all volatile results except Toluene should be considered the most usable. The Toluene results for sample 108-S01-027DL should be considered the most usable.

CLP Semivolatile Organic Analysis

A. No results for CLP semivolatile analysis were rejected in this SDG.

B. Due to instrument calibration, common laboratory contamination, and compound quantitation problems problems in the semivolatile analysis, several samples were qualified as estimated. The findings were as follows:

- Due to initial calibration %RSD problems, 3-Nitroaniline and 4-Nitroaniline nondetected results were qualified as estimated in nine samples.
- Due to common laboratory contamination problems, Diethylphthalate and Di-n-octylphthalate were qualified nondetect in two samples and Bis(2-ethylhexyl)phthalate was qualified nondetect in four samples.
- Due to continuing calibration %D problems, 4-Chloroaniline nondetected results were qualified as estimated in nine samples, 4-Nitrophenol and 4-Nitroaniline nondetected results were qualified as estimated in four samples, 3-Nitroaniline, 2,4-Dinitrophenol, and Dibenz(a,h)anthracene nondetected results were qualified as estimated in five samples.
- Due to compound quantitation problems, 2,4-Dimethylphenol detected results were qualified as estimated in two samples and Naphthalene detected results were qualified as estimated in one sample.
- All detected results reported below the CRQL were qualified as estimated.
- All tentatively identified compounds were qualified (NJ).

C. Samples 108-S01-022*, 108-S01-027*, and 108-S01-016 were diluted due to sample results exceeding the calibration range. For samples 108-S01-022* and 108-S01-027*, all semivolatile results except 2,4-Dimethylphenol should be considered the most usable. The 2,4-Dimethylphenol results for samples 108-S01-022DL* and 108-S01-027DL* should be considered the most usable. For sample 108-S01-016, all semivolatile results except Naphthalene should be considered the most usable. The Naphthalene results for samples 108-S01-016DL should be considered the most usable.

CLP Metals Analysis

A. No results for CLP metals analysis were rejected in this SDG.

B. Due to instrument calibration, calibration and method blank contamination, MS, DUP, and serial dilution problems in the CLP metals analysis, several samples were qualified as estimated. The findings were as follows:

- Due to instrument calibration problems, Iron results were qualified as estimated in fourteen samples and Copper results were qualified as estimated in one sample.
- Due to calibration and method blank contamination problems, Aluminum was qualified nondetect in eighteen samples, Antimony and Zinc were qualified nondetect in eleven samples, Arsenic and Copper were qualified nondetect in ten samples, Chromium was qualified nondetect in five samples, Iron was qualified nondetect in eight samples, Lead was qualified nondetect in three samples, Selenium was qualified nondetect in seven samples, and Vanadium was qualified nondetect in four samples.
- Due to MS recovery and DUP difference problems, Lead results were qualified as estimated in eighteen samples.
- Due to serial dilution problems, Copper and Potassium results were qualified as estimated in eighteen samples.
- All detected results reported above the IDL but below the CRDL were qualified as estimated.

C. No samples were reextracted or reanalyzed for CLP metals analysis in this SDG.

TPH Gasoline Analysis

A. No results for TPH gasoline analysis were rejected in this SDG.

B. Due to surrogate recovery problems, TPH gasoline detected results were qualified as estimated in two samples.

C. Sample 108-S01-022* was reanalyzed due to high surrogate recoveries. For sample 108-S01-022*, all TPH gasoline results should be considered the most usable.

TPH Extractable Analysis

A. No results for TPH extractable analysis were rejected in this SDG.

B. Due to LCS problems in the TPH extractable analysis, several samples were qualified as estimated. The findings were as follows:

- Due to LCS/LCSD percent recovery problems, TPH extractable results were qualified as estimated in five samples.
- All detected results reported below the RL were qualified as estimated.

C. No samples were reextracted or reanalyzed for TPH extractable analysis in this SDG.

Non-CLP Inorganic and Physical Analysis

A. No results for non-CLP inorganic and physical analysis were rejected in this SDG.

B. Due to technical holding time, MS, and sample result verification problems in the non-CLP inorganic and physical analysis, several samples were qualified as estimated. The findings were as follows:

- Due to technical holding time problems, Total dissolved solids detected results were qualified as estimated in five samples.
- Due to MS recovery problems, Bromide results were qualified as estimated in sixteen samples.

C. No samples were reextracted or reanalyzed for non-CLP inorganic and physical analysis in this SDG.

III. The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the cursory and full data validation, all other results are considered valid and usable for all purposes.